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## NEW CLUBHOUSE

**H. SMITH RICHARDSON GOLF COURSE**  
2425 MOREHOUSE HIGHWAY  
FAIRFIELD, CT 06824

S/P+A PROJECT NO. 18.124

### S/P+A PROCUREMENT AND CONTRACT REQUIREMENTS

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TOWN OF FAIRFIELD
PURCHASING AUTHORITY
725 OLD POST ROAD
INDEPENDENCE HALL
FAIRFIELD, CT 06824.

Date Submitted ________________ 2019

Bidder:

Doing Business As (Trade Name)

Address

Town, State, Zip

(Ms/Ms) Name and Title, Printed

Signature

Telephone    Fax

E-mail

Sealed bids will be received by the Purchasing Authority at the office of the Director of Purchasing, First Floor, Independence Hall, 725 Old Post Road, Fairfield, Connecticut 06824, up to:

11:00am, Tuesday, 17th September, 2019

To provide labor, materials, equipment and all else necessary to demolish the existing building and construct a new Clubhouse at H. Smith Richardson Golf Course as detailed in the attached specifications.

NOTES:

1. Bidders are to complete all requested data in the upper right corner of this page and must return this page and the Proposal page with their bid.
2. No bid shall be accepted from, or contracts awarded to, any person/companyaffiliate or entity under common control who is in arrears to the Town of Fairfield upon debt, or contract or who has been within the prior five (5) years, a defaulter as surety or otherwise upon obligations to the Town of Fairfield, and shall be determined by the Town.
3. Bid proposals are to be submitted in a sealed envelope and clearly marked “BID #2020-01” on the outside of the envelope, including all outer packaging, such as, DHL, FedEx, UPS, etc.
4. Bid proposals are not to be submitted with plastic binders or covers, nor may the bid proposal contain any plastic inserts or pages.

2020-01 H. SMITH RICHARDSON CLUBHOUSE REBUILD
Page 1 of 11
INVITATION TO BID

The Town of Fairfield (Town) on behalf of the H. Smith Richardson Building Committee (HSRBC) is seeking competitive bids from qualified Contractors to construct a new Clubhouse located at H. Smith Richardson Golf Course, 2425 Morehouse Highway, Fairfield, Connecticut. The Contractor shall be responsible for the demolition and disposal of the existing 7,400 square foot building, as well as all labor and materials to construct a new 9,540 square foot clubhouse in accordance with all Plans and Specifications prepared by Silver/Petrucelli + Associates, Inc.

PRE-BID SITE MEETING

A site meeting will commence at **10:00am**, H. Smith Richardson, 2425 Morehouse Highway, Fairfield, Connecticut, on **Tuesday, 13th August, 2019**, for prospective bidders to scope the conditions.

- While the meeting is non-mandatory, prospective bidders will be required to sign-in at commencement of the meeting. The sign-in sheet will be posted on the Purchasing Department website as below. Copies will not be made available at the meeting, nor will they be faxed out.
- All requests for information will be answered in writing as specified below under Addenda.

ADDENDA / REQUESTS FOR INFORMATION (RFI)

Addenda concerning important information and/or modifications to specifications will be posted on the Fairfield Purchasing Department website at [www.fairfieldct.org/purchasing.htm](http://www.fairfieldct.org/purchasing.htm)

- It is each Bidder’s sole responsibility to monitor the above website for all updated information.
- Addenda will not be mailed, e-mailed or faxed out.
- Written requests for information will not be accepted after **11:00am on Monday, 26th August, 2019**.
- Verbal requests for information via phone or other means will not be accepted.
- Failure to comply with these conditions will result in the bidder waiving the right to dispute bid specifications and conditions, no exceptions.

Questions concerning this bid must be submitted in writing and directed only to:

Corinne Dyer, Senior Buyer
cdyer@fairfieldct.org

Response will be in the form of an addendum that will be posted approximately **29th August, 2019** to the Town of Fairfield website, which is [www.fairfieldct.org](http://www.fairfieldct.org). It is the responsibility of each bidder to retrieve addenda from the website. Any contact about this bid between a Bidder and any other Town official and/or department manager and/or Town of Fairfield employee, other than as set forth above, may be grounds for disqualification of that Bidder. No questions or clarifications shall be answered by phone, in person or in any other manner than specified above.

BID BOND / BID SECURITY

A five (5) percent bid bond or equal approved security as stated per the Terms and Conditions must be submitted with the proposal.

All bonds, including payment and performance bonds when applicable, shall be written by a surety company or companies licensed to issue bonds in the State of Connecticut, and shall have at least an A-VII policy holders rating, as reported by A.M. Best Rating Services, or otherwise deemed acceptable by the Town. The Town always reserves the right to reject surety companies, if an approved surety bond cannot be provided the bidder shall be deemed non-responsive.

A complete list of certified surety companies can be accessed on the U.S. Government Department of Treasury website; [https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm](https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm)

REQUIREMENTS

A. Any sizes or estimate of quantities as shown on drawings are approximate and are not guaranteed in any respect. Prospective bidders are to visit the site to verify scope of the work, measurements, quantities, etc., prior to bidding. The Town reserves the right at all times to increase or decrease the amount of work if deemed in its best interest.

B. Price is to include all labor, materials, tools, equipment, plans, mobilization, permits, insurances, etc., required to properly complete the project.

C. The Town of Fairfield reserves the right to award the bid with multiple items:

- to more than one bidder, based on meeting the item(s) specification, cost, availability, or any combination of these criteria;
to a single bidder who meets the specifications for all items, and offers the best combination of lowest cost, best availability, and broadest product range;
and may add, subtract or delete any item and/or quantity as deemed in the best interest of the Town.

D. The Bidder must not discriminate, nor permit discrimination, against any person on the grounds of race, color, national origin, religion, sex, handicap, or veteran status, in their employment practices, in any of their contractual arrangements, in all service and accommodations they offer to the public, and in any of their other business operations.

E. The successful bidder MUST secure all required licenses and permits (local, state, federal) prior to commencing work on the site.

F. Award of the project, either partial or in its entirety, is contingent upon funding approval by the applicable boards of the Town of Fairfield, including state and federal agencies.

G. This is a prevailing wage rates project and is subject to all CTDOL requirements. Certified Payroll will be required for all work completed.

H. Upon Award, all bidding documents shall constitute a legal contract including but not limited to the following: Bid Invitation, Addendum, CT DOL Prevailing Wage Documents, Award Resolution, Town Purchase Order, and AIA Contracts.

I. In the instance the Contractor discovers unanticipated hazardous material, whether it be in nature or capacity, the Town reserves the right to terminate the Contract and regain possession of the project site.

J. Work shall not commence until 7:00 am on weekdays and 8:00 am on weekends in accordance with the Town Noise Ordinance.

K. DAS Prequalification: The Contractor shall hold a current “DAS Contractor Prequalification Certificate” (not a predetermination letter) from the Department of Administrative Services of the State of Connecticut according to C.G.S.§4b-91. Bidders are advised that both the DEPARTMENT OF ADMINISTRATIVE SERVICES PREQUALIFICATION CERTIFICATE and UPDATE (BID) STATEMENT must accompany the bid proposal for bids of Five Hundred Thousand Dollars ($500,000) or more (C.G.S. 4b-91), or must be in-place at the time of contract signing. Failure to supply these documents with the bid will result in rejection of the bid. Further information may be obtained from the Department of Administrative Services (DAS) Contractor Prequalification Program: http://das.ct.gov/cr1.aspx?page=10
- All Bidders shall be DAS Prequalified Construction Contractors with a General Building Construction (Group B) Classification.

ENCLOSURES
Project manual and Construction Docs prepared by Silver/Petrucelli + Associates, Inc.

Draft AIA Contracts- AIA Document A701 (Instructions to Bidders), AIA Document 201 (General Conditions of the Contract for Construction), AIA Document G702 (Sample Application for payment)

CT DOL Prevailing Wage Rate package

BASIS OF AWARD
The Town’s intention is to award to the lowest qualified bidder and to complete all work listed under the base bid, including all add alternates, if the budget allows. The Town may add, subtract or delete any item and/or quantity as deemed in the best interest of the Town. It is the Town’s right to award to a single bidder who meets the specifications for all items, and offers the best combination of lowest cost and best availability.

1.) The bid proposal form includes a base bid, along with a series of potential add-alternates and deduct-alternates.

2.) The list of add-alternates and deduct-alternates was created by the H. Smith Richardson Building Committee as a means of managing the overall cost of the project.

3.) To the extent that base bids are received below the current project construction budget, priority will be given to the lowest qualified bidder with the three add-alternates included (base bid + add alternates #1 through #3).

4.) To the extent that base bids are received above the current project construction budget, priority will be given to the lowest qualified bidder with the elimination of the cart barn addition as a deduct-alternate (base bid + deduct-alternate #9).
5.) To the extent that bids received with the elimination of the cart barn addition as a deduct-alternate included are above the current project construction budget, priority will be given to the lowest qualified bidder with the elimination of the cart barn from the scope entirely (base bid + deduct-alternate #10).

6.) To the extent that base bids received, together with the elimination of the cart barn from the project scope entirely are still above the current project construction budget, priority will be given to the lowest qualified bidder to include the remaining deduct-alternates (base bid + deduct alternates #4, #5/6, #7, #8, and #10).
PURCHASING AUTHORITY
TOWN OF FAIRFIELD
INSTRUCTIONS FOR BIDDERS
TERMS AND CONDITIONS OF BID

BID PROPOSALS
Bid proposals are to be submitted in a sealed envelope and clearly marked on the outside “BID #2020-01” including all outer packaging such as DHL, FedEx, UPS, etc. All prices and notations must be printed in ink or typewritten. No erasures are permitted. Bid proposals are to be in the office of the Purchasing Authority, First Floor, Independence Hall, 725 Old Post Road, Fairfield, Connecticut, prior to date and time specified, at which time they will be publicly opened.

RIGHT TO ACCEPT / REJECT
AFTER REVIEW OF ALL FACTORS, TERMS AND CONDITIONS, INCLUDING PRICE, THE PURCHASING AUTHORITY OF THE TOWN OF FAIRFIELD RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS, OR ANY PART THEREOF, OR WAIVE DEFECTS IN SAME, OR ACCEPT ANY PROPOSAL DEEMED TO BE IN THE BEST INTEREST OF THE TOWN OF FAIRFIELD.

QUESTIONS
Questions concerning conditions, bidding guidelines and specifications should only be directed in writing to:

Ms. Corinne M. Dyer, Senior Buyer: CDyer@fairfieldct.org

Inquiries must reference date of bid opening, requisition or contract number, and must be received no later than as indicated in the bid documents prior to date of bid opening. Failure to comply with these conditions will result in the bidder waiving the right to dispute the bid specifications and conditions.

PRICES
Prices quoted must be firm, for acceptance by the Town of Fairfield, for a period of one hundred and twenty (120) days. Prices shall include all applicable duties. Bidders shall be required to deliver awarded items at prices quoted in their original bid.

F.O.B. DESTINATION
Prices quoted shall be Net – Delivered to destination. Bids quoting other than F.O.B. Destination may be rejected.

BID BOND
The BID BOND furnished, as bid security, must be duly executed by the bidder as principal. It must be in the amount equal to five percent (5%) of the total estimated bid, as guarantee that, in case the contract is awarded to the bidder, the bidder will, within ten days thereafter, execute such contract and furnish a Performance Bond and Payment Bond.

Small businesses may elect to obtain an irrevocable letter of credit or cashier’s check in lieu of the Bid Bond. Such surety must also be in an amount equal to at least five percent (5%) of the total estimated bid.

All bid bonds shall be written by a surety company or companies licensed in the State of Connecticut, and shall have at least an A-VII policy holders rating, as reported by A.M. Best Rating Services, or otherwise deemed acceptable by the Town. The Town always reserves the right to reject surety companies, if an approved surety bond cannot be provided, the bidder shall be deemed non-responsive.

A complete list of certified surety companies can be accessed on the U.S. Government Department of Treasury website:
https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm

NOTE: Failure to provide a Bid Bond or equivalent security is not cause for a waiver defect. Any bid not accompanied by such security will be excluded from consideration.

PERMITS
The contractor will be responsible for securing all necessary permits, state and local, as required by the Town of Fairfield. The Town will waive its application and permit fees for Town of Fairfield projects.
PAYMENT PROCEDURES
No voucher, claim or charge against the Town shall be paid without the approval of the Fiscal Officer for correctness and legality. Appropriate checks shall be drawn by the Fiscal Officer for approved claims or charges and they shall be valid without countersignature unless the Board of Selectmen otherwise prescribed.

PAYMENT PERIOD
The Town of Fairfield shall put forth its best effort to make payment within thirty days (30) after delivery of the item acceptance of the work, or receipt of a properly completed invoice, whichever is later. Payment period shall be net thirty days (30) unless otherwise specified. For projects that do not require a performance or bid bond, the Town of Fairfield reserves the right to retain five percent (5%) of total bid amount, which is payable ninety (90) days after final payment or acceptance of the work.

THE CONTRACTOR
The Contractor for the work described shall be thoroughly familiar with the requirements of all specifications, and the actual physical conditions of various job sites. The submission of a proposal shall be construed as evidence that the Contractor has examined the actual job conditions, requirements, and specifications. Any claim for labor, equipment, or materials required, or difficulties encountered which could have been foreseen had such an examination been carefully made will not be recognized.

ASSIGNMENT OF CONTRACT
No contract may be assigned or transferred without the consent of the Purchasing Authority.

AWARD OF BIDS
Contracts and purchases will be made or entered into with the lowest, qualified responsible bidder meeting specifications, except as otherwise specified in the invitation. If more than one item is specified in the invitation, the Town of Fairfield reserves the right to determine the low bidder on an individual basis or on the basis of all items included in the Invitation for Bids, unless otherwise expressed by the Town.

PERFORMANCE AND LABOR AND MATERIAL BOND
The successful bidder, within seven (7) business days after notification of award, will be required to furnish Performance and Labor and Material Bond provided by a company authorized to issue such bonds in the State of Connecticut, or Certified Check or properly executed Irrevocable Letter of Credit equal to a hundred per cent (100%) of the award.

In the event that the Contractor where required to provide evidence of insurance and a performance bond does not do so before beginning work, the Town of Fairfield reserves the right to withhold payment from such supplier until the evidence of insurance and performance bond has been received by the Town.

All payment and performance bonds shall be written by a surety company or companies licensed to issue bonds in the State of Connecticut, and shall have at least an A-VIII policy holders rating, as reported by A.M. Best Rating Services, or otherwise deemed acceptable by the Town. The Town always reserves the right to reject surety companies, if approved surety bonds cannot be provided the contract shall be terminated.

A complete list of certified surety companies can be accessed on the U.S. Government Department of Treasury website: https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm

BOND REQUIREMENT – NON-RESIDENT CONTRACTORS

1. Non-resident contractors are required to deposit with the Department of Revenue Services a sum equivalent to 5% of the total contract value, as assurance that personal property taxes and/or any other State taxes assessed and due the State during the contract will be paid.
2. If this surety is not deposited with the State, the Town is required to deduct and submit to the State 5% of the total contract value.

GUARANTEE
Equipment, materials and/or work executed shall be guaranteed for a minimum period of one (1) year against defective material and workmanship. The cost of all labor, materials, shipping charges and other expenses in conjunction with the replacement of defective equipment, and/or unsatisfactory work, shall be borne by the Contractor.

CATALOGUE REFERENCE
Unless expressly stated otherwise, any and all reference to commercial types, sales, trade names and catalogues are intended to be descriptive only and not restrictive; the intent is to indicate the kind and quality of the articles that will be acceptable. Bids on other equivalent makes, or with reference to other catalogue items will be considered. The bidder is to clearly state exactly what will be furnished. Where possible and feasible, submit an illustration, descriptive material, and/or product sample.
INSURANCE COVERAGE REQUIREMENTS

A. The Town of Fairfield is requiring insurance coverage as listed below for this work.

Note: The term "General Contractor" (hereinafter called the "Contractor") shall also include their respective agents, representatives, employees or subcontractors; and the term "Town of Fairfield" (hereinafter called the "Town") shall include their respective officers, agents, servants, officials, employees, volunteers, boards and commissions.

Note: The term "Town of Fairfield" or "Town" is to be taken to mean Town of Fairfield and the Fairfield Board of Education when the project includes the Board of Education.

At least five days before the Contract is executed and prior to commencement of work there under the Contractor will be required to submit to the Town of Fairfield, Risk Manager, 725 Old Post Road, Fairfield, CT 06824 a certificate of insurance, executed by an authorized representative of the insurance company, satisfactory to the Town’s Risk Manager and in an acceptable form. The Town always reserves the right to reject insurance companies, if approved insurance policies cannot be provided the contract shall be terminated.

INSURANCE RIDER

Without limiting its liability under this Contract, the Contractor shall provide and maintain in full force and effect at all times during the term of this Contract, insurance coverage related to its services in connection with the Project in compliance with the following requirements.

The insurance required shall be written for not less than the scope and limits of insurance specified hereunder, or required by applicable federal, state and/or municipal law, regulation or requirement, whichever coverage requirement is greater. It is agreed and understood that the scope and limits of insurance specified hereunder are minimum requirements and shall in no way limit or preclude the Town from requiring additional limits and coverage to be provided under the Contractor’s policies.

B. Minimum Scope and Limits of Insurance:

Worker’s Compensation Insurance:
- In accordance with the requirements of the laws of the State of Connecticut.
- Five hundred thousand dollars ($500,000) Employer Liability each accident
- Five hundred thousand dollars ($500,000) Employer Liability each employee by disease
- Five hundred thousand dollars ($500,000) Employer Liability policy limit coverage for disease

Commercial General Liability:
- Bodily Injury, Personal Injury and Property Damage one million dollars ($1,000,000) each occurrence, two million dollars ($2,000,000) aggregate.
- Products/Completed Operations one million dollars ($1,000,000) each occurrence, two million dollars ($2,000,000) aggregate.

Automobile Liability:
- A combined single limit of one million dollars ($1,000,000), including owned, hired and non-owned coverage and rider CA9948 or equivalent.

Umbrella/Excess Liability Insurance
- Five million dollars ($5,000,000) each occurrence, five million dollars ($5,000,000) aggregate. Such coverage must be follow form over Worker’s Compensation, Commercial General Liability, and Automobile Liability.

Pollution Liability Insurance:
- Where applicable, five million dollars ($5,000,000) including coverage for transport and other offsite risk. Such policy must be given to the Town’s Risk Manager for review and determination of acceptability before an award will be made.

Indemnification: The Contractor shall defend, indemnify and save harmless the Town and its officers, agents, servants, officials, employees, volunteers, boards and commissions from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses of any nature, including attorneys’ fees, on account of bodily injury, sickness, disease, death or any other damages sustained by any person or persons injury or damage to or destruction of any property, directly or indirectly arising out of, relating to, or in connection with the work called for in the Contract, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence, fault or contractual default of the Contractor, its officers, agents, servants or employees, any of its sub-contractors, the Town, any of its respective officers, agents, servants, officials, employees, volunteers, boards and commissions and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false, or fraudulent, and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings, provided, however, that the Contractor shall not be required to indemnify the Town, its officers, agents, servants, officials, employees, volunteers, boards and commissions, against any such damages occasioned solely by acts or omissions of the Town, its officers, agents, servants, officials, employees, volunteers, boards and commissions, other than
"Tail" Coverage: If any of the required liability insurance is on a claims-made basis, "tail" coverage will be required at the completion of this contract for a duration of 36 months, or the maximum time period reasonably available in the marketplace. The Contractor shall furnish certification of "tail" coverages described or continuous "claims made" liability coverage for 36 months following Contract completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage provided its retroactive date is on or before the effective date of this Contract. If continuous "claims made" coverage is used, the Contractor shall be required to keep the coverage in effect for duration of not less than 36 months from the end of the Contract.

Acceptability of Insurers: The Contractor's policies shall be written by insurance companies licensed to do business in the State of Connecticut, with a A.M. Best rating of A- VIII or otherwise acceptable by the Town's Risk Manager.

Subcontractors: The Contractor shall require subcontractors to provide the same "minimum scope and limits of insurance" as required herein, with the exception of Errors and Omissions/Professional Liability insurance/Fiduciary Liability, unless Errors and Omissions/Professional Liability/Fiduciary Liability insurance is applicable to the work performed by the subcontractor. All Certificates of Insurance shall be provided to and approved by the Town’s Risk Manager prior to the commencement of work, as required herein.

Aggregate Limits: It is agreed that the Contractor shall notify the Town when fifty percent (50%) of the aggregate limits are eroded during the contract term. If the aggregate limit is eroded for the full limit, the Contractor agrees to reinstate or purchase additional limits to meet the minimum limit requirements stated herein. The premium shall be paid by the Contractor.

Deductibles and Self-Insured Retentions: Any deductible or self-insured retention must be declared to, and approved by, the Town. All deductibles or self-insured retentions are the sole responsibility of the Contractor to pay and/or to indemnify. Under no circumstances will the Town be responsible for paying any deductible or self-insured retentions related to this Contract.

Notice of Cancellation or Non-renewal: Each insurance policy required shall be endorsed to state that coverage shall not be suspended, voided, cancelled, or reduced in coverage or in limits except after 30 days prior written notice by certified mail, return receipt requested, has been given to the Town, (provided ten (10) days’ prior written notice shall be sufficient in the case of termination for nonpayment).

Waiver of Governmental Immunity: Unless requested otherwise by the Town, the Contractor and its insurer shall waive governmental immunity as defense and shall not use the defense of governmental immunity in the adjustment of claims or in the defense of any suit brought against the Town.

Additional Insured: The liability insurance coverage, except Errors and Omissions, Professional Liability or Workers Compensation, if included, required for the performance of the Contract shall include the Town as Additional Insured but only with respect to the Contractor’s activities to be performed under this Contract. Coverage shall be primary and non-contributory with any other insurance and self-insurance.

Waiver of Subrogation: A waiver of subrogation in favor of the Town is required on all policies.

Waiver/Estoppel: Neither approval by the Town nor failure to disapprove the insurance furnished by the Contractor shall relieve the Contractor of the Contractor’s full responsibility to provide insurance as required under this Contract.

Contractor’s Insurance Additional Remedy: Compliance with the insurance requirements of this Contract shall not limit the liability of the Contractor or its Sub-Contractors/Firms, employees or agents to the Town or others. Any remedy provided to the Town shall be in addition to, and not in lieu of, any other remedy available under this Contract or otherwise.

Certificate of Insurance: As evidence of the insurance coverage required by this Contract, the Contractor shall furnish Certificate(s) of Insurance to the Town’s Risk Manager prior to the award of the Contract if required by the Bid document, but in all events prior to Contractor’s commencement of work under this Contract. The Certificate(s) will specify all parties who are endorsed on the policy as Additional Insured (or Loss Payees). The certificates and endorsements for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. Renewals of expiring certificates shall be filed thirty (30) days prior to expiration. The Town reserves the right to require complete, certified copies of all required policies at any time. All insurance documents required should be mailed to Town of Fairfield, Chief Financial Officer, 725 Old Post Road, Fairfield, CT 06824 and Town of Fairfield, Risk Manager, 725 Old Post Road, Fairfield, CT 06824.

Additional Insureds: The Town of Fairfield, Fairfield Board of Education, its officers, officials, employees, agents, Boards, and Commissions shall be named as Additional Insureds on the General Contractor's and Subcontractors’ Commercial General Liability, (for ongoing and completed operations), Automobile, and Umbrella. The coverage shall be primary and non-contributory and contain no special limitations on the scope of protection afforded to the Town of Fairfield. A waiver of subrogation applies under general liability, auto liability and workers compensation.

The coverage shall be primary and non-contributory and contain no special limitations on the scope of protection afforded to the Town of Fairfield. A waiver of subrogation applies under general liability, auto liability and workers compensation.

Subcontractor’s Insurance: Each Subcontractor engaged by the Contractor to perform any work under the Contract shall obtain all insurance required of the Contractor in the same amounts and subject to the same provisions specified above for the Contractor, including the Additional Insured requirement. Certificates of Insurance shall be submitted to the Contractor and the Town and approved by the Town, before commencing any work.

2020-01 H. SMITH RICHARDSON CLUBHOUSE REBUILD Page 8 of 11
PURCHASING AUTHORITY
TOWN OF FAIRFIELD
INSTRUCTIONS FOR BIDDERS
TERMS AND CONDITIONS OF BID

HOLD HARMLESS
Contractor shall defend, indemnify, and hold harmless the Town of Fairfield, its officers, employees, agents or volunteers, from and against any and all claims and demands of any nature for any loss, damage or injury which any person may suffer by reason of, or in any way arising out of, this Agreement, unless caused by the sole negligence of the Town.

OSHA
The bidder will certify all equipment complies with all regulations and conditions stipulated under the Williams-Steiger Occupational Safety and Health Act of 1971, as amended. The successful bidder will further certify that all items furnished under this project will conform and comply with Federal and State of Connecticut OSHA standards. The successful bidder will agree to indemnify and hold harmless the Town of Fairfield for any and all damages that may be assessed against the Town.

FEDERAL, STATE, AND LOCAL LAWS
All applicable Federal, State and local laws, rules and regulations of all authorities having jurisdiction over the locality of the project shall apply to the contract and are deemed to be included herein. If the total amount of the project, including any current or future change orders, exceeds $100,000.00 all work is to be done in accordance with Connecticut Department of Labor (CT-DOL) rules and regulations. More information may be obtained from: www.ctdol.state.ct.us

NOTE: The Town shall apply the most current wage decision applicable at the time of contract award.

CONFLICT OF INTEREST
No officer or employee or member of any elective or appointive board, commission or committee of the Town, whether temporary or permanent, shall have or acquire any financial interest gained from a successful bid, direct or indirect, aggregating more than one hundred dollars ($100.00), in any project, matter, contract or business within his/her jurisdiction or the jurisdiction of the board, commission, or committee of which he/she is a member. Nor shall the officer / employee / member have any financial interest, direct or indirect, aggregating more than one hundred dollars ($100.00) in any contract or proposed contract for materials or services to be furnished or used in connection with any project, matter or thing which comes under his/her jurisdiction or the jurisdiction of the board, commission, committee of which he/she is a member.

SCOPE OF WORK/SITE INSPECTIONS
The bidder declares that the scope of the work has been thoroughly reviewed and any questions resolved (see above for name and number of individual to contact for questions). If applicable, the bidder further declares that the site has been inspected as called for in the specifications (q.v.).

EXCEPTION TO SPECIFICATIONS
No protest regarding the validity or appropriateness of the specifications or of the Invitation for Bids will be considered, unless the protest is filed in writing with the Purchasing Authority prior to the closing date for the bids. All bid proposals rendered shall be considered meeting the attached specifications unless exceptions are noted on a separate page dated and signed by the bidder.

UNLESS OTHERWISE NOTED
It will be assumed that all terms and conditions and specifications will be complied with and will be considered as part of the Bid Proposal.

TAX EXEMPT
Federal Tax Exemption 06-6001998.
Exempt from State Sales Tax under State General Statues Chapter 219-Section 12-412 Subsection A.
REFERENCES
Provide reference details of most recent similar scope projects performed.

REFERENCE #1:
<table>
<thead>
<tr>
<th>Name of Company</th>
<th>Phone</th>
<th>Contact Person</th>
<th>Cell</th>
<th>Company Address</th>
<th>Email</th>
<th>Project, Location, &amp; Date Completed</th>
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SUBCONTRACTORS
Provide subcontractor details if any are to be employed as part of this contract, including labor rates:

**SUBCONTRACTOR #1:**

<table>
<thead>
<tr>
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<tbody>
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<tr>
<td>Rates: Supervisor $________/hr</td>
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<td>Apprentice $_______/hr</td>
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</table>

**NOTE:** All sub-Contractors are subject to approval by the Town of Fairfield and are required to provide Fed ID #.
Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

H Smith Richardson Golf Course Clubhouse
2425 Morehouse Highway
Fairfield, CT 06824

THE OWNER:
(Name, legal status, address, and other information)

Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

THE ARCHITECT:
(Name, legal status, address, and other information)

Silver Petrucelli + Associates
3190 Whitney Avenue
Hamden, CT 06518

TABLE OF ARTICLES

1 DEFINITIONS
2 BIDDER’S REPRESENTATIONS
3 BIDDING DOCUMENTS
4 BIDDING PROCEDURES
5 CONSIDERATION OF BIDS
6 POST-BID INFORMATION
7 PERFORMANCE BOND AND PAYMENT BOND
8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner’s Instructions to the Architect, Parts A and B will be completed prior to using this document.
ARTICLE 1   DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other sample bidding and contract forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement’s Exhibits, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, all Addenda, Addenda issued prior to execution of the Contract, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, as modified and included in the bidding documents, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect or Architect prior to the execution of the Contract, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

§ 1.10 Letter of Intent is a formal written document that will identify the Contract Commencement Date, what portion of the Work the Contractor can proceed with and what the time frame requirement is for having the formal Owner/Contractor Agreement executed.

ARTICLE 2   BIDDER’S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

1. the Bidder has read and understands the Bidding Documents;
2. the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
3. the Bid complies with the Bidding Documents;
4. the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder’s observations with the requirements of the Proposed Contract Documents;
5. the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
6. the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

§ 2.2 A pre-bid conference will be held at the site, at the date, time, and location included in the Invitation to Bid. Each Bidder of Record may attend the pre-bid conference and visit the Site of the proposed Work and become fully acquainted with the conditions as they exist and understand the difficulties and restrictions of the facilities. Bidders shall also thoroughly examine and be familiar with the Drawings and the Project Manual, including Specifications. The failure or
omission of any bidder to examine any form, instrument, addendum, or other document, or to visit the site and acquaint themselves with conditions there existing shall in no way relieve said Bidder from any obligation with respect to their bid.

§ 2.3 Before submitting a bid, each Bidder must familiarize themselves with federal, state and local laws, ordinances, rules and regulations that may in any manner affect the cost, progress, or performance of the Work and correlate the observations with the Contract Documents.

§ 2.4 The submission of a bid will constitute an incontrovertible representation by the Bidder that it has complied with every requirement of this Article 2 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

ARTICLE 3   BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Town of Fairfield’s website, www.fairfieldct.org)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder’s deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2. Any conflict existing between the Drawings and the Specifications and not corrected or clarified by written addenda before Bids are submitted shall be resolved on the basis of the Owner’s Representative’s interpretation as to which of the conflicting requirements shall govern. The Contractor shall perform the Work at no additional cost to the Owner.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids, in accordance with the Invitation to Bid.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution, substitution in the Base Bid.
§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect and Owner’s Representative at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution, including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s Owner’s Representative’s decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect Owner or Owner’s Representative approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.3.6 Bidders are encouraged to provide voluntary alternates for materials or alternative products that the Bidder feels may meet the design intent of the Project, but provides the Owner with higher value in lower cost or higher quality. These voluntary alternates are to be listed and described with associated cost changes from the Base Bid. These voluntary alternates will be considered by the Owner’s Representative and the Owner in evaluating Bids and selecting a successful Bidder. The amount of the Base Bid must be submitted in strict accordance with the Contract Documents and must not include the value of any voluntary alternates.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents, posted to the Town of Fairfield’s website.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

www.fairfieldct.org

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, or as stated elsewhere, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

§ 3.5 Unit Prices

§ 3.5.1 Provide unit prices for all items indicated in the Bid Form.
§ 3.5.2 The unit prices, if accepted in the award of this Contract, shall be used in establishing the adjustment of Contract price for additions or deductions from the Work in accordance with the applicable section of the General Conditions. Unit prices listed shall include all costs, profit, and overhead and no further surcharges are to be added to any unit price item of work that may be ordered done. Unit prices accepted by the Owner shall be written into the Owner/Contractor Agreement.

§ 3.6 Labor and Material Rates
§ 3.6.1 Provide labor and material rates for all items indicated in the Bid Form.

§ 3.6.2 The labor and material rates, if accepted in the award of this Contract, shall be used in establishing the adjustment of Contract price for additions or deductions from the Work in accordance with the applicable section of the General Conditions. Unit prices listed shall include all costs, profit, and overhead and no further surcharges are to be added to any unit price item of work that may be ordered done. Unit prices accepted by the Owner shall be written into the Owner/Contractor Agreement.

§ 3.7 Fees for Subcontractor Changes in the Work
§ 3.7.1 Provide fees for Subcontractor changes in the Work for all items indicated in the Bid Form.

§ 3.7.2 The fees for Subcontractor changes in the Work, if accepted in the award of this Contract, shall be used in establishing the adjustment of Contract price for additions or deductions from the Work in accordance with the applicable section of the General Conditions. Unit prices listed shall include all costs, profit, and overhead and no further surcharges are to be added to any unit price item of work that may be ordered done. Unit prices accepted by the Owner shall be written into the Owner/Contractor Agreement.

ARTICLE 4 BIDDING PROCEDURES
§ 4.1 Preparation of Bids
§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security bond, state the Bidder’s refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent’s authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.1.9 The Owner is an institution exempt from sales tax. Bidders shall take this in consideration in calculating their Bid. Tax Exemption Number will be furnished to the selected Contractor.

§ 4.2 Bid Security
§ 4.2.1 Each Bid shall be accompanied by the following bid security as indicated on the Invitation to Bid: (Insert the form and amount of bid security.)
§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, bonds, the amount of the bid security bond shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security bond shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, and it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security bond of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 30 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

Paper Copy

§ 4.3.2 Paper copies of the Bid, the bid security bond, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder’s name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation “SEALED BID ENCLOSED” on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security bond shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect, Owner’s Representative of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, Owner’s Representative, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)
§ 4.4.4 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid. Bids may be withdrawn only by written request received before Bid due date. No Bids may be modified or withdrawn after the Bid due date, and all Bids shall be irrevocable for ninety (90) calendar days after the Bid due date.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids
If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids
Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.2.1 Any Bid may be rejected if it includes unexplained interlineations, alterations or erasures or if it is subject to any qualifications or restrictions added by the Bidder or if it is in any way incomplete or irregular.

§ 5.2.2 Any Bid may be rejected if the Bidder cannot show that they can procure the necessary plans to commence the Work at the time prescribed and thereafter to execute and complete the Work at the rate of time specified, and that they are not already obligated for the performance of other work which would delay the commencement, execution, or completion of the Work.

§ 5.2.3 Should the successful Bidder fail to furnish the prescribed Surety Bonds or fail to execute the Agreement within the prescribed time limit, he shall be held in default. In such event, the responsible Bidder submitting the next lowest Bid, as determined by the same procedure, may then become the successful Bidder and, on their receipt in writing of notice of Contract award, shall be subject to all provisions of the bidding requirements and Contract Documents.

§ 5.3 Acceptance of Bid (Award)
§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive qualified and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner’s judgment, is in the Owner’s best interests. The Owner reserves the right to waive any informality in any Bid.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor’s Qualification Statement
Bidders to whom award of a Contract is under consideration shall submit to the Architect, Owner’s Representative, upon request and within the timeframe specified by the Architect, Owner’s Representative, a properly executed AIA Document A305™, Contractor’s Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner’s Financial Capability
A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner’s obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.
§ 6.3 Submittals
§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:
  1. a designation of the Work to be performed with the Bidder’s own forces;
  2. names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
  3. names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect Owner’s Representative and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect Owner’s Representative will notify the Bidder if either the Owner or Architect Owner’s Representative has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect Owner’s Representative has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder’s option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security bond will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect Owner’s Representative have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect Owner’s Representative.

§ 6.4 Work Phasing Schedule
Bidders to whom award of the Contractor is under consideration shall submit to the Architect within fifteen (15) days of the Contract date, a detailed work Phasing Schedule describing the bodies of work to be undertaken and areas of the Project to be addressed in per week periods between the Award of the Contract and the Bidder’s proposed date of Substantial Completion.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND
§ 7.1 Bond Requirements
§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Prior to the execution of the Contract, the successful Bidder shall be required to procure, execute and deliver to the Owner’s Representative, for the Owner, a Performance Bond and a Labor and Material Payment Bond in amounts equaling, in each case, not less than the full Contract amount. Such Bonds shall be submitted on AIA Document A312. The costs of such Bonds shall be included in the Bid.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum. (If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds
§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to
§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.

(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.

(Insert the complete AIA Document number, including year, and Document title.)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.

(Insert the complete AIA Document number, including year, and Document title.)

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013.)

.5 Drawings

<table>
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<th>Number</th>
<th>Title</th>
<th>Date</th>
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</table>

.6 Specifications

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<tr>
<th>Section</th>
<th>Title</th>
<th>Date</th>
<th>Pages</th>
</tr>
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</table>

.7 Addenda:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
</table>

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:

(Insert the date of the E204-2017.)
ARTICLE 9  MISCELLANEOUS REQUIREMENTS

§ 9.1 Watchman
The employment of continuous watchman service to guard the property during any and all hours shall be at the discretion of the Contractor. However, the Contractor shall remove and restore all work or temporary structures damaged by fire, vandalism or similar acts at no extra cost to the Owner.

§ 9.2 Overtime
The Contractor must include within their base price all overtime, nights, holidays and weekends as required to meet the Project Completion date.

§ 9.3 Supervision
The Contractor must provide full-time, properly qualified on-site supervision for the entire duration of the Project, while work persons are on site.
BIDDER: __________________________________________

Name ____________________________________________

Address __________________________________________

To: Town of Fairfield
c/o Purchasing Department
725 Old Post Road
Fairfield, CT 06825

Project: H. Smith Richardson Golf Course Clubhouse
2425 Morehouse Highway
Fairfield, CT 06824

In preparing this bid, we have carefully examined the Bidding Documents for this Project. We have visited the site and noted the conditions affecting the Work.


We propose to perform the work described in the Bidding Documents, in keeping with definitions of Article 1 of the Instructions to Bidders, for the Base Bid Sum as follows:

Base Bid:

Entire Project for the Total Cost of:

$ _______________________________ Dollars ($ ____________ .00).

written figure

We will commence work on the project ______ calendar days after receipt of "Notice to Proceed" or signing of Contract, whichever is sooner. We will be able to substantially complete the project within ______ calendar days thereafter. (See Invitation to Bid).

Alternates:

The undersigned proposes to furnish all Labor, Materials, Equipment and Services necessary to construct the items listed in the Alternates described in Section 012300 for the stipulated sum of:

ADD ALTERNATE NO. 1: Flagpole: Add to the Base Bid a Total of:

$ _______________________________ Dollars ($ ____________ .00).

written figure

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Add Alternate 1.
ADD ALTERNATE NO. 2: Folding Panel Doors: Add to the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Add Alternate 2.

ADD ALTERNATE NO. 3: Landscape Lighting: Add to the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Add Alternate 3.

DEDUCT ALTERNATE NO. 4: Front of Building Asphalt Paving: Deduct from the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 4.

DEDUCT ALTERNATE NO. 5: Patio Asphalt Pavement – 70: Deduct from the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 5.

DEDUCT ALTERNATE NO. 6: Patio Asphalt Pavement - 30: Deduct from the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 6.

DEDUCT ALTERNATE NO. 7: Front of Building Curbs: Deduct from the Base Bid a Total of:

$ ________________ Dollars ($ ___________ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 7.
DEDUCT ALTERNATE NO. 8: Exterior Decorative Sconces: Deduct from the Base Bid a Total of:

$_____________ Dollars ($ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 8.

DEDUCT ALTERNATE NO. 9: Cart Barn Addition: Deduct from the Base Bid a Total of:

$_____________ Dollars ($ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 9.

DEDUCT ALTERNATE NO. 10: Cart Barn Elimination: Deduct from the Base Bid a Total of:

$_____________ Dollars ($ .00).

The project schedule will be (increased/decreased) by _____ calendar days to complete the work indicated under Deduct Alternate 10.

Unit Prices:

As required by the Base Bid, should deteriorated or damaged materials be required to be removed as determined by the Architect or Owner, the cost to remove and replace the referenced material, (or credit for specified material not provided or installed) including all labor, material, equipment and related furnishings is as follows:

1. Small containment preparation containment (less than 160 square/260 linear feet of asbestos containing material) $_____/containment

   *Pricing for containments with larger amounts of materials are to be INCLUDED in the unit prices themselves listed below. There is no separate unit price for containments with larger amounts.

2. Floor tile/flooring materials and mastic (includes all layers of carpeting/adhesives/multiple layers of floor tiles/flooring materials/linoleum/sheet flooring/vinyl/ceramic/wood/mastics/levelastics/contaminated flooring materials/etc.), removal and disposal as ACM $_____/sf

3. Mudded pipe fitting insulation, removal and disposal as ACM $_____/fitting/joint

4. Glove bag, removal and disposal as ACM $_____/bag

5. Pipe and pipe fitting insulation, removal and disposal as ACM $_____/lf

6. Duct insulation, removal and disposal as ACM $_____/sf

7. Duct adhesives (including contaminated substrates), removal and disposal as ACM $_____/sf

8. Light backing paper insulation, removal and disposal as ACM $_____/fixture

9. Duct vibration isolation cloth, removal and disposal as ACM $_____/cloth

10. Countertop/Adhesive (including contaminated substrates), removal and disposal as ACM $_____/sf
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit Cost</th>
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<tbody>
<tr>
<td>11.</td>
<td>Transite cement board, removal and disposal as ACM</td>
<td>$________/sf</td>
</tr>
<tr>
<td>12.</td>
<td>Fire door/insulation, removal and disposal as ACM</td>
<td>$________/door</td>
</tr>
<tr>
<td>13.</td>
<td>Wall adhesives including contaminated substrates (mirrors/blackboards/bulletin boards/wood/wall tiles/siding/foam board/etc.), removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>14.</td>
<td>Vermiculite and associated wall/ceiling materials, removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>15.</td>
<td>Ceramic tile wall/floor, adhesives, dampproofing and contaminated substrates, removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>16.</td>
<td>Dampproofing/Tars/Mastics/Papers – interior/exterior walls/floors/slab/foundation and associated substrate/adjacent materials (includes multiple layers, contaminated materials and substrates), removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>17.</td>
<td>Electrical insulation, removal and disposal as ACM</td>
<td>$_____/lf</td>
</tr>
<tr>
<td>18.</td>
<td>Window sill adhesives (including contaminated substrates), removal and disposal as ACM</td>
<td>$_____/lf</td>
</tr>
<tr>
<td>19.</td>
<td>Boiler/HVAC/Mechanical units (including all exterior and interior materials), removal and disposal as ACM</td>
<td>$_____/unit</td>
</tr>
<tr>
<td>20.</td>
<td>Freezers/Dampproofing/Contaminated cor/Contaminated substrates/other material, removal and disposal as ACM</td>
<td>$_____/freezer</td>
</tr>
<tr>
<td>21.</td>
<td>Caulking, glazing and sealant compounds (includes substrates and contaminated materials), removal and disposal as ACM</td>
<td>$_____/lf</td>
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<td></td>
<td></td>
<td>$_____/window opening</td>
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<td></td>
<td></td>
<td>$_____/door opening</td>
</tr>
<tr>
<td>22.</td>
<td>Caulking, glazing and sealant compound, removal and disposal as ACM and PCBs &lt; 50 ppm (CT DEEP Regulated PCB Waste)</td>
<td>$_____/lf</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_____/window opening</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$_____/door opening</td>
</tr>
<tr>
<td>23.</td>
<td>Caulking, glazing and sealant compound, removal and disposal as PCBs &gt; 50 ppm (PCB Bulk Product Waste)</td>
<td>$_____/window opening</td>
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<tr>
<td></td>
<td></td>
<td>$_____/door opening</td>
</tr>
<tr>
<td>24.</td>
<td>Roofing core/field base material (includes multiple layers and substrates), removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>25.</td>
<td>Roof flashing (includes multiple layers and substrates), removal and disposal as ACM</td>
<td>$_____/sf</td>
</tr>
<tr>
<td>26.</td>
<td>Off-site transportation and disposal of natural soil</td>
<td>$_____/ton</td>
</tr>
<tr>
<td></td>
<td>*Natural Soils have no detectable concentrations of non-naturally occurring compounds.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Off-site transportation and disposal of polluted soil</td>
<td>$_____/ton</td>
</tr>
<tr>
<td></td>
<td>*Polluted Soils contain concentrations of non-naturally occurring compounds detected above laboratory reporting limits, but below the CT DEEP RSR criteria in accordance with RCSA 22a-133k-1(a)(45). Polluted soils can be reused on-site with the preparation of a Materials Management Plan and approval from the Engineer.</td>
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<tr>
<td>28.</td>
<td>Off-site transportation and disposal of contaminated soil</td>
<td>$_____/ton</td>
</tr>
<tr>
<td></td>
<td>*Contaminated Materials contain concentrations of compounds that exceed CT DEEP RSR criteria in accordance with RCSA 22a-133k. Contaminated materials (concrete, soil, sediment, groundwater or</td>
<td></td>
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</tbody>
</table>
surface water) can NOT be reused on-site and must be disposed of at an off-site disposal facility.

29. Off-site transportation and disposal of hazardous waste/soils $_______/ton

*Hazardous Waste/Soils includes all soil/fill material that exceeds regulatory limits for hazardous substances as defined in 40 CFR, Part 261.20 Subpart C – Characteristics of Hazardous Waste. This material can NOT be reused on-site and must be disposed of at an off-site approved disposal facility.

30. Exterior soil, removal and disposal as PCB Remediation Waste $_______/cy

If written notice of the acceptance of this Bid is mailed, telegraphed or delivered to the undersigned at the Address designated below, within ninety (90) days after the date of Bid Opening, or any time thereafter before this Bid is withdrawn, the undersigned will, within ten (10) days after the date of mailing, telegraphing or delivering of the notice, execute and deliver a contract in the Standard Form of Agreement Between the Owner and Contractor, AIA Document A101, or similar contract modified as may be mutually agree upon.

The undersigned acknowledges that he has examined the documents, visited and examined the site as required under "Instructions to Bidders", examined the availability of labor and materials and further agrees to comply with all the requirements as to the conditions of employment and wage rates set forth by the Department of Labor.

**Addenda:**

The undersigned acknowledges receipt of the following addenda to the Contract Documents, listed by number and date:

<table>
<thead>
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<th>Number</th>
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**Exceptions:**

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**ATTACHMENTS – Attached hereto is:**

1. **Bid Bond**

**NON-COLLUSIVE BID STATEMENT**

The undersigned bidder certifies that this bid is made independently and without collusion, agreement, understanding or planned course of action with any other bidder and that the contents of the bid shall not be disclosed to anyone other than employees, agents or sureties prior to the official bid opening.

Signature: ____________________________  Date: ____________

Printed Name and Title of Agent submitting bid: ____________________________
Name of Company: _____________________________________________________________

Address:  ____________________________________________________________________

Telephone Number: ___________________________  Fax Number: ______________________

E-mail:  ________________________________________________________________

This Bid may be withdrawn prior to the scheduled Bid Opening or any postponement thereof.
AGREEMENT made as of the    day of    in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

and the Contractor:
(Name, legal status, address and other information)

TBD

for the following Project:
(Name, location and detailed description)

H Smith Richardson Golf Course Clubhouse
2425 Morehouse Highway
Fairfield, CT 06824

The Architect:
(Name, legal status, address and other information)

Silver Petrucelli + Associates
3190 Whitney Avenue
Hamden, CT 06518

The Owner and Contractor agree as follows.
TABLE OF ARTICLES

1. THE CONTRACT DOCUMENTS
2. THE WORK OF THIS CONTRACT
3. DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4. CONTRACT SUM
5. PAYMENTS
6. DISPUTE RESOLUTION
7. TERMINATION OR SUSPENSION
8. MISCELLANEOUS PROVISIONS
9. ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS
The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT
The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
( Check one of the following boxes. )

[ ] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
( Insert a date or a means to determine the date of commencement of the Work. )

The date of commencement for mobilization is November 11, 2019. Golf operations are scheduled to stop on November 4, 2019 allowing one week for all golf operations in the existing clubhouse and cart barn to vacate. Substantial Completion dates are based upon the commencement date of November 22, 2019.

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion
§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(\textit{Check one of the following boxes and complete the necessary information.})

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

The cart barn shall be substantially complete by March 15, 2020. This date is based upon a mobilization date of November 11, 2019.

The remaining Work indicated as described in the Contract Documents shall be substantially complete by September 1, 2020.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

<table>
<thead>
<tr>
<th>Portion of Work</th>
<th>Substantial Completion Date</th>
</tr>
</thead>
</table>

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5 of the Work in accordance with the Contract Times set forth above, the Owner shall be entitled to retain or recover from the Contractor, as liquidated damages and not as a penalty, the following per diem amounts commencing upon the first calendar day following the expiration of the Contract Times set forth above and continuing until the actual Date of Substantial Completion for cart barn and remaining Work, respectively. Such liquidated damages are hereby agreed by all parties to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed completion of the Work. These liquidated damages are hereby agreed to be actual per diem costs for liquidated damages. No further evaluation of actual damages will be considered by either the Owner or the Contractor. Liquidated damages shall be in the amount of One Thousand Dollars ($1,000) per calendar day. The Owner may deduct liquidated damages from any unpaid amounts then or thereafter due the Contractor under this Agreement. Any liquidated damages not so deducted shall be payable to the Owner at the demand of Owner, together with interest from the date of the demand at a rate of one percent (1%) per month payable by the Contractor.

§ 3.3.4 The Contractor shall achieve Final Completion of the entire Work not later than 60 days from the date of Substantial Completion or as follows:

(\textit{Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of Substantial Completion. Unless stated elsewhere in the Contract Documents, insert any requirements for earlier Final Completion of certain portions of the Work.})

The Contractor shall achieve Final Completion of the entire Work not later than

<table>
<thead>
<tr>
<th>Portion of Work</th>
<th>Final Completion Date</th>
</tr>
</thead>
</table>

subject to adjustments of this Contract Time as provided in the Contract Documents.

(\textit{Insert provisions, if any, for liquidated damages relating to failure to complete on time or for bonus payments for early completion of the Work.})

If the Contractor fails to achieve Final Completion of the Work in accordance with the Contract Times set forth above, the Owner shall be entitled to retain or recover from the Contractor, as liquidated damages and not as a penalty, the following per diem amounts commencing upon the first calendar day following the expiration of the Contract Times set forth above and continuing until the actual Date of Final Completion. Such liquidated damages are hereby agreed by all parties to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed completion of the Work. These liquidated damages are hereby agreed to be actual per diem costs for liquidated damages. No further evaluation of actual damages will be considered by either the Owner or the Contractor. Liquidated damages shall be in
the amount of One Thousand Dollars ($1,000) per calendar day. The Owner may deduct liquidated damages from any unpaid amounts then or thereafter due the Contractor under this Agreement. Any liquidated damages not so deducted shall be payable to the Owner at the demand of Owner, together with interest from the date of the demand at a rate of one percent (1%) per month payable by the Contractor.

### ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be TBD ($ ), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Conditions for Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

§ 4.3 Allowances, if any, included in the Contract Sum:

(Identify each allowance.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
</table>

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Units and Limitations</th>
<th>Price per Unit ($0.00)</th>
</tr>
</thead>
</table>

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

See Section 3.3.3

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

None

### ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:
§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the last day of the next calendar month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than forty-five (45) days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with Section 9.2 of AIA Document A201–2017 modified, as included in the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values and Owner may require. This schedule of values, unless objected to by the Architect and Owner, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, modified General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:
.1 That portion of the Contract Sum properly allocable to completed Work;
.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
.3 That portion of Construction Change Directives that the Architect and Owner determines, in the Architect’s and Owner’s professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:
.1 The aggregate of any amounts previously paid by the Owner;
.2 The amount, if any, for Work that remains uncorrected and for which the Architect and Owner has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017; A201–2017, modified;
.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect and Owner may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; A201–2017, modified; and
.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

None

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

See Section 9.8.6 of AIA Document A201-2017, General Conditions as modified and included in the Contract Documents.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

1. the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, modified, and to satisfy other requirements, if any, which extend beyond final payment; and

2. a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

in accordance with Section 9.10 in AIA-201-2017, General Conditions as modified and included in the Contract Documents.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

% 

ARTICLE 6   DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker provide an initial interpretation of all claims pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker modified.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)
§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, modified, the method of binding dispute resolution shall be as follows:

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017, modified

[ ] Litigation in a court of competent jurisdiction

[ ] Other (Specify) pursuant to Section 15.4 of AIA Document A201-2017, modified

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017, modified.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017, modified.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017, modified or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

Charles E. Warrington, Jr. P.E.
Director
Colliers Project Leaders USA NE, LLC
135 New Road
Madison, CT 06443

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

TBD
§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds
§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, modified, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, modified, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, modified, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS
§ 9.1 This Agreement is comprised of the following documents:
.1 AIA Document A101™–2017, modified, Standard Form of Agreement Between Owner and Contractor
.2 AIA Document A101™–2017, modified, Exhibit A, Insurance and Bonds
.3 AIA Document A201™–2017, modified, General Conditions of the Contract for Construction
.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

INFORMATION AND CODE DRAWINGS
A001 GENERAL INFORMATION & DRAWING LIST
A002 BUILDING CODE PLANS & INFORMATION

CIVIL/LANDSCAPING DRAWINGS
EX-00 SITE NOTES & LEGEND
EX-1 EXISTING CONDITIONS TOPOGRAPHIC SURVEY
ESC-0 EROSION CONTROL PLAN & NOTES
ESC-1 PHASING PLAN PHASE 01
ESC-2 PHASING PLAN PHASE 02
ESC-3 PHASING PLAN PHASE 03
L-1 SITE PREPARATION PLAN
L-2A-L2B SITE LAYOUT PLAN
L-2C PAVEMENT SCORING & ALTERNATES PLAN
L-2D CART BARN ALTERNATES 9 & 10
L-2E SCOPE OF WORK BY TOWN OF FAIRFIELD
L-3A-L-3B GRADING PLAN
L-4A  SITE DETAILS
C-1  OVERALL SITE UTILITY PLAN
C-2  OVERALL GRADING & DRAINAGE PLAN
C-3  TYPICAL UTILITY DETAILS
C-4  TYPICAL DRAINAGE DETAILS
R-1  IRRIGATION SYSTEM CONSTRUCTION DOCUMENTS
C100  EXISTING CONDITIONS PLAN
C101-C199  NOT USED
C200  SITE LAYOUT PLAN
C201-C299  NOT USED
C300  SITE GRADING & UTILITIES PLAN
C301-C399  NOT USED
C400  SITE DETAILS
C401-C499  NOT USED
C500  EROSION & SEDIMENT CONTROL NOTES & DETAILS
C501-C599  NOT USED
C600  SITE LANDSCAPING PLAN

ARCHITECTURAL DRAWINGS
A003-A029  NOT USED
A030  MAIN BUILDING – DEMOLITION PLANS
A031  MAIN BUILDING DEMO ELEVATION
A032  CART BARN DEMO PLANS
A033-A099  NOT USED
A100  MAIN BUILDING OVERALL PLAN
A101  MAIN BUILDING – PART PLAN ‘A’
A102  MAIN BUILDING – PART PLAN ‘B’
A103  ADD ALTERNATE NO. 2 – FLOOR PLAN, ELEVATIONS & DETAILS
A104  NOT USED
A105  CART BARN PLAN
A106-A109  NOT USED
A110  MAIN BUILDING ROOF PLAN
A111  CART BARN ROOF PLAN
A112-A116  ROOF DETAILS
A117-A139  NOT USED
A140  FLOOR PLAN DETAILS
A141-A169  NOT USED
A170  ENLARGED TOILET PLANS
A171-A179  NOT USED
A180  CHIMNEY DETAILS
A181  CLERESTORY PLAN & DETAILS
A182  CLERESTORY DETAILS
A183-A200  NOT USED
A201  MAIN BUILDING RCP – PART ‘A’
A202  MAIN BUILDING RCP – PART ‘B’
A203-A239  NOT USED
A240  FINISH & FLOOR PATTERN PLAN – ‘A’ WING
A241  FINISH & FLOOR PATTERN PLAN – ‘B’ WING
A242-A299  NOT USED
A300-A301  MAIN BUILDING EXTERIOR ELEVATIONS
A302-A304  NOT USED
A305  CART BARN EXTERIOR ELEVATIONS
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**ENVIRONMENTAL DRAWINGS**

HBM-01 MAIN BUILDING – HAZARDOUS BUILDING MATERIALS ABATEMENT PLAN

**STRUCTURAL DRAWINGS**

S100 MAIN BUILDING FOUNDATION OVERALL PLAN
S101 MAIN BUILDING FOUNDATION – PART PLAN ‘A’
S102 MAIN BUILDING FOUNDATION – PART PLAN ‘B’
S102A MAIN BUILDING NANAWALL ALTERNATE PLANS & DETAILS
S103 CART BARN FOUNDATION PLAN
S104-S108 NOT USED
S109 MAIN BUILDING CEILING FRAMING – PART PLAN ‘B’
S110 MAIN BUILDING ROOF FRAMING – PART PLAN ‘A’
<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>S111</td>
<td>MAIN BUILDING ROOF FRAMING – PART PLAN 'B'</td>
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<tr>
<td>S112</td>
<td>CART STORAGE ROOF FRAMING PLAN</td>
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**FIRE PROTECTION DRAWINGS**

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<td>WING 'A' MAIN LEVEL/WING 'B' LOWER CEILING AREAS FIRE PROTECTION PLANS</td>
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<td>WING 'A' ATTIC/WING 'B' ATTIC &amp; HIGH CEILING AREAS FIRE PROTECTION PLAN</td>
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**PLUMBING DRAWINGS**

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**MECHANICAL DRAWINGS**

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Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

| .8 | Other Exhibits: |

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*
AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

The Sustainability Plan:

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Supplementary and other Conditions of the Contract:

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Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017, modified, provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)  
(Printed name and title)  

CONTRACTOR (Signature)  
(Printed name and title)
This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of month in the year (In words, indicate day, month and year.)

for the following PROJECT:
(Name and location or address)

H Smith Richardson Golf Course Clubhouse
2425 Morehouse Highway
Fairfield, CT 06824

THE OWNER:
(Name, legal status and address)

Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

THE CONTRACTOR:
(Name, legal status and address)

TBD

TABLE OF ARTICLES

A.1 GENERAL
A.2 OWNER’S INSURANCE
A.3 CONTRACTOR’S INSURANCE AND BONDS
A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL
The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER’S INSURANCE
§ A.2.1 General
Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor’s request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance
The Owner shall be responsible for purchasing and maintaining the Owner’s usual general liability insurance.
§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder’s risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner’s property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

(Indicate below the cause of loss and any applicable sub-limit.)

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§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect’s and Contractor’s services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

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§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions. Property insurance requires deductibles, the party initiating the claim shall pay costs not covered because of such deductibles. Notwithstanding, if the cause of any loss payment under such insurance is the fault of the Contractor, then Contractor shall pay such deductible.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner’s occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure.
§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[ ] § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance, to reimburse the Owner for loss of use of the Owner’s property, or the inability to conduct normal operations due to a covered cause of loss.

[ ] § A.2.4.2 Ordinance or Law Insurance, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[ ] § A.2.4.3 Expediting Cost Insurance, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[ ] § A.2.4.4 Extra Expense Insurance, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[ ] § A.2.4.5 Civil Authority Insurance, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[ ] § A.2.4.6 Ingress/Egress Insurance, for loss due to the necessary interruption of the insured’s business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

[ ] § A.2.4.7 Soft Costs Insurance, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.
§ A.2.5 Other Optional Insurance.
The Owner shall purchase and maintain the insurance selected below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

[ ] § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. (Indicate applicable limits of coverage or other conditions in the fill point below.)

[ ] § A.2.5.2 Other Insurance
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

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<th>Coverage</th>
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§ A.2.6 Time Limits on Claims. Claims made by any party must be initiated within 30 calendar days after occurrence of the event giving rise to such Claim or within 30 calendar days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to the Owner’s Representative and the Surety.

ARTICLE A.3 CONTRACTOR’S INSURANCE AND BONDS
§ A.3.1 General
§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner’s written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor’s Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect’s consultants as additional insureds; as additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner’s general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect’s consultants, CG 20 32 07 04.

§ A.3.1.3.1 The limits specified in the contract documents are minimum requirements and shall not be construed in any way as limits of liability or as constituting acceptance by Owner of responsibility for losses in excess of such limits. The Contractor shall be responsible for all deductibles applicable to any insurance. No acceptance and/or approval of any insurance by Owner shall be construed as relieving or excusing Contractor from any liability or obligation imposed by the provisions of the Contract Documents.

The Contractor shall provide a Blanket Additional Insured Endorsement and shall provide Owner with evidence of worker’s compensation coverage.
§ A.3.1.3.2 The Contractor shall not commence the Work under the Contract nor permit any subcontractor to commence work on a subcontract until all the insurance required is obtained. The Contractor may carry, at its own expense, such additional coverage as it may deem necessary. The Contractor shall not be deemed to be relieved of any responsibility by the fact it carries insurance. Should the Contractor at any time neglect or refuse to provide the insurance required herein or should such insurance be cancelled, or should the full annual aggregate or any policy not be available to satisfy the requirements of the Contract, the Owner shall have the right to procure such insurance and the cost thereof shall be deducted from monies then due or thereafter to become due the Contractor.

§ A.3.2 Contractor's Required Insurance Coverage
§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability
§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than ($ ) each occurrence, ($ ) general aggregate, and ($ ) aggregate for products-completed operations hazard, providing coverage for claims including:
.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
.2 personal injury and advertising injury;
.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor’s Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:
.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
.2 Claims for property damage to the Contractor’s Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
.3 Claims for bodily injury other than to employees of the insured.
.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
.8 Claims related to roofing, if the Work involves roofing.
.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
.10 Claims related to earth subsidence or movement, where the Work involves such hazards.
.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than ($ ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.
§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers’ Compensation at statutory limits.

§ A.3.2.6 Employers’ Liability with policy limits not less than ($ ) each accident, ($ ) each employee, and ($ ) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers’ Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate.

§ A.3.3 Contractor’s Other Insurance Coverage
§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[ ] § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 08:41:09 ET on 08/05/2019 under Order No.6077399792 which expires on 12/05/2019, and is not for resale. (1431777860)
accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor’s obligation to provide property insurance differs from the Owner’s obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

| § A.3.3.2.2 Railroad Protective Liability Insurance | with policy limits of not less than ($ ) per claim and ($ ) in the aggregate, for Work within fifty (50) feet of railroad property. |
| § A.3.3.2.3 Asbestos Abatement Liability Insurance | with policy limits of not less than ($ ) per claim and ($ ) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials. |
| § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form. |
| § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment. |
| § A.3.3.2.6 Other Insurance | (List below any other insurance coverage to be provided by the Contractor and any applicable limits.) |

§ A.3.3 Such coverage shall be maintained for no less than four (4) years following final payment. The Owner shall be named additional insureds. Contractor shall provide a Blanket Additional Insured Endorsement. Contractor shall provide Owner with evidence of workers’ compensation coverage.

§ A.3.4 Performance Bond and Payment Bond
The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

(Specify type and penal sum of bonds.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Penal Sum ($0.00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment Bond</td>
<td></td>
</tr>
<tr>
<td>Performance Bond</td>
<td></td>
</tr>
</tbody>
</table>

The surety, form and substance of the bond shall be satisfactory to the Owner. Surety companies executing bonds must appear on the Treasury Department’s most current list (Circular 570, as amended) and be authorized to transact business in the state in which the Project is located.

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS
Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:
AIA Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT: (Name and location or address)
H Smith Richardson Golf Course Clubhouse
2425 Morehouse Highway
Fairfield, CT 06824

THE OWNER: (Name, legal status, Name and address)
Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

THE ARCHITECT: (Name, legal status, Name and address)
Silver Petrucelli + Associates
3190 Whitney avenue
Hamden, CT 06518

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2 OWNER
3 CONTRACTOR
4 ARCHITECT
5 SUBCONTRACTORS
6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7 CHANGES IN THE WORK
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9 PAYMENTS AND COMPLETION
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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
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User Notes:
ARTICLE 1   GENERAL PROVISIONS
§ 1.1 BASIC DEFINITIONS
§ 1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor’s bid or proposal, or portions of Addenda relating to bidding requirements. As used herein, "Contractor" shall also mean "Construction Manager".

§ 1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, except as set forth in Sections 5.3 and 5.4, (3) between the Owner and the Architect or the Architect’s consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect’s duties.

§ 1.1.3 THE WORK
The term “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT
The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS
The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS
The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE
Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect’s consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.1.9 The terms "knowledge", "recognize", "observe" and "discover", their respective derivatives and similar terms, as used in the Contract Documents referring to the Contractor, shall be interpreted to mean what the Contractor knows (or should reasonably know), recognizes (or should reasonably recognize), observes (or should observe) and discovers (or should discover) in exercising the care, skill and diligence required by the Contract Documents. Analogously, the expression "reasonably inferable" shall be interpreted to mean reasonably inferable...
§1.1.10 TERMINOLOGY
1. Unless otherwise indicated the term "provide" shall include furnishing and installing a product, materials, systems, and/or equipment complete in place, fully tested and approved.
2. The terms "approved" and/or "approval" shall mean approved and/or approval in writing unless otherwise indicated.
3. The term “Contractor” shall also mean “Construction Manager” for purposes of this Agreement.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the event of inconsistencies within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall (i) provide the better quality or greater quantity of Work or (ii) comply with the more stringent requirement; either or both in accordance with the Architect's interpretation.

1. On the Drawings, given dimensions shall take precedence over scaled measurements, and large scale drawings over small scale drawings.

2. Before requesting the ordering of any material or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project site and shall be responsible for the correctness of such measurements. No extra charges or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings.

3. If a minor change in the Work is found to be necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure to the Architect for approval before making the change.

4. Contractor shall thoroughly acquaint itself with and comply with the terms, statutes, rules and regulations governing excavation in the area of underground utilities.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. The Contractor and all Subcontractors shall refer to all Contract Documents, including those not specifically showing the Work of their specialized trades, and shall perform all Work necessary to produce the results shown or reasonably inferable therefrom.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 Dimensions given on the Drawings govern scale measurements and large scale drawings govern small scale drawings. All documents are complementary and specific items of work are shown only where most appropriate for clarity. The Drawings are generally made to scale, but all working dimensions shall be taken from the figured dimensions, or by actual measurements taken at the job, and in no case by scaling. Whether or not an error is believed to exist, deviation from the Drawings and the dimensions given thereon shall be made only after approval in writing from the Architect.

§ 1.2.5 All indications or notations which apply to one or a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

§ 1.2.6 It shall be understood that the Architect's drawings are diagrammatic and the Contractor and subcontractors shall work in cooperation with each other in determining the running of pipe lines and locating equipment. Any necessary variation shall be made to conform to the intent of the diagrammatic drawings without
§ 1.2.7 All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturers’ written instructions unless specifically indicated otherwise in the Contract Documents.

§ 1.3 CAPITALIZATION
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION
In the interest of brevity the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.5.1 The Architect and the Architect’s consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights, except as may be required under the Agreement with the Owner. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect’s or Architect’s consultants’ reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect’s consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
CHARACTER AND INTENT OF DRAWINGS
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents. During the bidding or negotiation period, questions or discrepancies called to the Architect’s attention, in writing, will be answered by the Architect by means of an addendum. All addendums shall become part of the Contract Documents. If any item of Work is shown on the Drawings and not specified, or mentioned in the Specifications and not shown on the Drawings, the matter shall be brought to the attention of the Architect during the bidding period so an addendum can be issued correcting the omission. If such correction is not made, the Work in question shall be considered to be required as if it has been specified and shown on the Drawings.

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative. The term "Owner’s Representative" means the Owner’s authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.
§ 2.1.3 The Owner shall not be responsible for construction means, methods, techniques, sequences and procedures or for site safety except as stated in Article 6.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Contractor’s performance of the Work with reasonable promptness after receiving the Contractor’s written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.2.6 Unless otherwise provided in the Contract Documents the Owner will hire and pay for services including but not limited to independent materials testing and special inspections as determined necessary by the Architect and Owner to verify the compliance of materials and installations with the Contract Documents. These services provided by the Owner may include and are not limited to soils, cast in place concrete, masonry, steel and fireproofing inspections and testing. These services provided by the Owner do not relieve the Contractor of its obligations in Section 13.5.

§ 2.3 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.3.1 The Owner shall have the right to reject Work that it believes does not conform to the Contract Documents. However, neither this authority of the Owner nor a decision made to exercise or not exercise such authority shall give rise to a duty or responsibility of the Owner to the Contractor.

§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day—seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner’s expenses and expenses, including compensation for the Architect’s additional services made
necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner upon demand.

§ 2.4.1 In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

§ 2.4.2 The rights stated in this Article and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law, or (3) in equity.

§ 2.5 OWNER’S RIGHT TO INSPECT THE WORK

§ 2.5.1 The Owner has the right to have full access to and inspect all portions of the Work for quality, progress and conformance to the Contract Documents.

§ 2.6 COMMISSIONING

§ 2.6.1 The Owner will perform inspections and tests of systems to validate the proper installation and performance of the Work as intended and required by the Contract Documents. These tests and inspections may be performed by the Owner’s Representative or by independent contractors or consultants.

§ 2.6.2 The commissioning activities performed by the Owner in no way relieve or replace the obligations of the Architect or the Contractor in their fulfillment of Contract obligations.

§ 2.6.3 The commissioning agent of the Owner will utilize information provided by the Architect for design intent and the Contractor for actual installation conditions.

§ 2.6.4 Any commissioning activities are at the sole discretion of the Owner and not a requirement of this Agreement.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner or the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract or any amendment thereto by the Contractor is a representation that the Contractor has visited investigated the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. The Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the work is to be performed, including, without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas, (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools and equipment, and (5) other similar issues. The Owner shall not be required to make any adjustment in either the Contract Sum, Contract Time or any Milestone Date in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Section.
§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, and at frequent intervals during the progress thereof, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor. The Contractor shall promptly report to the Architect any errors, inconsistencies or omissions, error, inconsistency or omission discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. However, if the Contractor proceeds with the Work without such notice to the Architect, after having discovered such error, inconsistency or omission, or if by reasonable study of the Contract Documents by the Contractor, the Contractor shall pay all costs arising therefrom.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, regulations unless they bear upon the performance of the Work, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If any portion of the Contract Documents do not clearly define the Work, the Contractor shall immediately notify the Owner and Architect thereof, in writing, by utilizing a Request for Information (RFI) form, and shall request supplementary instructions before proceeding with such Work. If the Contractor proceeds with the Work without first obtaining such supplementary instructions, the Contractor shall make any repairs or corrections to the Work, as required by the Contract Documents, to complete the Work, at the Contractor’s expense. If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor’s notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, unless the Contractor recognized or should have recognized such error, inconsistency, omission or difference and failed to report it to the Architect or Owner. Nothing in this subparagraph 3.2.4 alleviates the Contractor of the legal compliance requirements of subparagraph 3.7.2.

§ 3.2.5 RFIs shall be submitted in a timely manner so as to cause no delay in the progress of the Work, and to allow adequate time for review and response prior to the date on which the Contractor’s current schedule of submittals requires a subsequent submittal which is dependent on the information requested. Unless another period of time is reasonably requested and agreed to at the time of submittal, the Architect shall respond to each RFI within not more than fourteen (14) days after receiving it. It is understood that larger, more complicated RFIs shall require more than fourteen (14) days to review and respond, but shall be a reasonable amount of time as mutually agreed at time of submission. RFIs shall be sequentially numbered and logged and tracked by the Contractor regardless of the source of the RFI was from the Contractor or Owner.

§ 3.2.6 The Contractor shall reimburse the Owner amounts charged to the Owner by the Architect for responding to an unreasonable number of Contractor’s Requests for Information where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, or project correspondence or documentation. Such amounts may be deducted by the Owner from any payment otherwise due the Contractor.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures, sequences, procedures, safety precautions, and for coordinating all portions of the Work.
under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, sequences, procedures, and safety precautions, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures. The Contractor shall then provide to the Owner and the Architect for review an alternative approach that satisfies the Contractor’s concerns regarding the construction means, methods, techniques, sequences, or procedures and meets the intent of the Construction Documents. A resolution must be reached that is agreeable to the Architect, Owner, and Contractor before the disputed work proceeds.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. Subcontractors and for any damages, losses, costs and expenses, including, but not limited to, attorney’s fees resulting from such acts or omissions.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall be responsible for coordinating, scheduling, notifying and cooperating with the independent materials testing and special inspections services hired and paid for by the Owner as outlined in Section 2.2.6.

§ 3.3.5 The Contractor shall only use specifically assigned areas for parking, storage of materials, and construction operations unless other areas are authorized by the Owner. The Contractor shall comply with any and all local, municipal and state regulations regarding use of and parking on public streets.

§ 3.3.6 The Contractor shall arrange for and attend weekly job meetings with the Architect, the Owner’s Project Manager, and such other persons as the Architect may from time to time wish to have present. The Contractor shall be represented by a principal, project manager, general superintendent, or other authorized main office representative, as well as by the Contractor’s own superintendent. An authorized representative of any Subcontractor or Sub-Subcontractor shall attend such meetings if the representative’s presence is requested by the Architect. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, Change Orders, time schedules, and manpower. Any notices required under the Contract may be served on such representatives. The recording of minutes for these job meetings and their timely distribution to the Owner and Architect shall be the responsibility of the Contractor unless agreed otherwise by the Owner, Architect and Contractor.

§ 3.3.7 The Contractor shall not be relieved of obligation to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner in the Owner’s administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

§ 3.3.8 The Contractor shall retain a competent Registered Professional Engineer or Registered Land Surveyor acceptable to the Architect who shall establish the exterior lines and required elevations of all buildings and structures to be erected on the site and shall establish sufficient lines and grades for the construction of associated Work such as but not limited to roads utilities and site grading. The Engineer or Land Surveyor shall certify as to the actual location for the constructed facilities in relation to property lines, building lines, easements and other restrictive boundaries. Such information shall be turned over to the Owner as a part of Record Documents.
§ 3.3.9 The Contractor shall establish the building grade elevations, levels, columns, walls and partition lines required by the Contractor and Subcontractors in laying out their Work.

§ 3.3.10 The Contractor shall coordinate and supervise the work performed by Subcontractors to ensure that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of their work and the storage of materials.

§ 3.4 LABOR AND MATERIALS
§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.4.4 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the project site. Protection of construction materials and equipment stored at the project site from weather, theft, damage, and other adversity is solely the responsibility of the Contractor.

§ 3.5 WARRANTY
§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, Architect or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer’s warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer’s warranties.

§ 3.5.3 The Contractor expressly warrants its' Work for one year after the date of Substantial Completion. Contractor shall make any repair or replacement to the Work resulting from defective materials and/or workmanship. Contractor shall commence making the repairs or replacements required pursuant to this Warranty within ten days after the Owner gives written notice to the Contractor. In the event of Contractor's failure to make timely corrections, Owner shall have the right to make corrections and Contractor shall be responsible for immediate payment thereof. Any other specific or extended warranties are as identified in the Project Manual.

§ 3.5.4 The warranty required by this Paragraph 3.5 shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise prescribed by law.

§ 3.5.5 The Contractor shall procure and deliver to the Architect, no later than thirty (30) calendar days after the Date of Substantial Completion, all warranties required by the Contract Documents.
§ 3.5.6 This Warranty shall include the repair and/or replacement of all damaged materials resulting from the defective materials and/or workmanship. This shall include but not be limited to furniture, fixtures, equipment, finishes or any other affected materials or property.

§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect. If the Owner is an institution exempt from sales tax, Bidders shall take this in consideration in calculating their bid. Tax Exemption Number will be furnished to the selected Contractor. In addition, the Contractor and subcontractors shall pay any and all compulsory taxes required or which may be imposed by any governmental agency, as applicable.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders and all other requirements of public authorities applicable to performance of the Work. The Contractor shall be responsible for scheduling all tests and inspections required by authorities having jurisdiction.

§ 3.7.2.1 It shall be the responsibility of all Contractors to confer with the various inspection offices of the local, state, or federal agency having jurisdiction over this construction project with the intent of verifying acceptability of materials and methods of construction indicated and specified herein. The respective Contractors and/or subcontractors shall visit the building inspector, plumbing inspector, electrical inspector, or any other inspection office having the authority for granting approvals or construction permits. The Contractor shall be responsible for scheduling all tests and inspections required by authorities having jurisdiction.

§ 3.7.2.2 All construction work shall conform to all prevailing codes.

§ 3.7.2.3 It is the responsibility of the Contractor to determine what local ordinances, if any, will affect its Work. It shall check for any county, city, borough, or township rules or regulations applicable to the area in which the project is being constructed, and in addition, for any rules or regulations of other organizations having jurisdiction, such as chamber-of-commerce, planning commissions, industries, or utilities companies who have jurisdiction over lands which the Contractor occupies.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction, costs, damages and expenses attributable to correction, and shall indemnify the Owner therefore, including supervision, reasonable attorney and professional fees.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Bid and Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in.

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User Notes:
writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites, memorial objects such as signs, trees, stones, etc., or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES
§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

1. Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

2. Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

3. Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.8.4 No allowances shall be included in the Bid Documents by the Architect unless specifically requested by the Architect and approved in writing by the Owner.

§ 3.9 SUPERINTENDENT
§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. The Project Manager, Assistant Project Manager, and Superintendent may not be removed without the prior written consent of the Owner. Owner reserves the right to have any employee of Contractor removed from the Project.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Owner or Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect or Owner requires additional time to review. Failure of the Architect and Owner to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner’s consent, which shall not unreasonably be withheld or delayed.

§ 3.9.4 The superintendent shall be in attendance at the project site at all times during the progress of the work until the date of substantial completion, and for such time thereafter necessary for the completion of the work.
§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract or as part of the Guaranteed Maximum Price (GMP) proposal, (if provided), shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. Work which will be considered the baseline schedule. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The baseline schedule shall be approved prior to submission of the first Pay Application.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect’s approval. The Architect’s approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals. The submittal schedule shall be approved prior to the first Pay Application. The submittal schedule shall be updated and reviewed at progress meetings.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.10.4 The construction schedule shall be in a detailed critical path method (CPM) type format satisfactory to the Owner and Architect which shall also (1) provide a graphic representation of all activities and events that will occur during performance of the Work, including but not limited to hazardous material remediation, demolition, furniture and equipment deliveries, Substantial Completion, move-in activities, commissioning, training, punch list, and final cleaning; (2) identify each phase of construction and occupancy; (3) identify float time associated with non-critical path activities and (4) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as Milestone Dates). Upon review and acceptance by the Architect and Owner, the construction schedule shall be deemed the Baseline Construction Schedule for the project and will be used to determine the validity of Claims for Additional Time as identified in Section 15.1.5. This Baseline Construction Schedule can only be modified with approved changes in Contract Time through the execution of a Change Order. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner and Architect of any delays or potential delays. The construction schedule shall be updated regularly to reflect actual conditions or if requested by the Owner or at least monthly. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an adjustment in the Contract Time, any Milestone Date or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to a Change Order.

§ 3.10.5 At weekly or biweekly construction progress meetings, the Contractor shall submit detailed two (2) week look ahead schedules which depict specific activities to occur during that period.

§ 3.10.6 The Contractor shall schedule and conduct construction and progress meetings, on a frequency required to effect coordination, to discuss such matters as procedures, progress, problems and scheduling. The Contractor shall prepare and distribute minutes within three working days of such meetings.

§ 3.10.7 The Contractor shall record the progress of the Project. Submit written progress reports not less frequently than monthly to the Owner and the Architect, including information on each Subcontractor and each Subcontractor’s Work, as well as the entire Project, showing percentages of completion and the number and amounts of Change Orders. The Contractor will keep a daily log containing a record of weather, Subcontractor’s Work on the site, number of workers, Work accomplished, problems encountered and other similar relevant data as the Owner may require. Upon request, Contractor shall make the log available to the Owner and the Architect.
§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, Orders, baseline schedule, current schedule, schedule of submittals, RFI log and other documents related to the Project as directed by the Architect, in good order and marked currently to indicate record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and Owner and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. A designated complete set of Contract Documents shall be maintained by the Contractor and kept onsite at all times with up-to-date red-line modifications that accurately record field conditions different than those shown on the original documents. These red-lined drawings shall be turned over to the Architect for record purposes no later than thirty (30) calendar days after the date of Substantial Completion. This set of "red-lined" drawings shall be maintained and kept current by the Contractor and their completeness shall be routinely inspected by the Architect and Owner. If these "red-lined" drawings are not maintained by the Contractor or kept current during construction, then the approval of Applications for Payment, as defined in Section 9.3, shall be denied.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action. The Contractor's approval shall be noted on the submitted item or in its transmittal letter, together with written notice of any deviation in the submitted item from the requirements of the Work and of the Contract Documents. In collaboration with the Architect, Contractor shall establish and implement procedures for expediting the processing and approval of Shop Drawings, Product Data, Samples and other submittals.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Each Shop Drawing, Product Data, Sample and similar submittals shall have a cover sheet on them identifying the project name and address, contractor information, drawing and/or specification reference, submission date and contents of the submittal. Ample space shall be provided on this cover sheet to allow for the Contractor’s and Architect’s review stamps. The Contractor’s approval shall be noted on the submitted item or in its transmittal letter, together with written notice of any deviation in the submitted item from the requirements of the Work and of the Contract Documents.

§ 3.12.6 By submitting and approving Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and so, (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents and, (4) coordinated with information on Shop Drawings, Product Data, Samples, or similar submittals previously approved by the Architect or submitted by the Contractor for approval but not yet acted upon by the Architect, and verification of compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In approving Shop Drawings, Product Data, Samples,
and similar submittals, the Architect shall be entitled to rely upon the Contractor’s representation that such information is accurate and in compliance with the Contract.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. If the Contractor procures, performs or installs portions of the Work without required approvals, the Contractor does so at its own risk and such Work may be removed or replaced with approved Work at no cost to the Owner.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect’s approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. Any submittals forwarded to the Architect for review that includes a deviation from the requirements of the Contract Documents or is not the specific make, model or manufacturer that was listed in the Contract Documents, shall have a completed Substitution Request Form attached to the submittal. This Substitution Request Form shall be provided by the Owner. Unless such deviation is identified by utilizing the Substitution Request Form, the Contractor shall not be relieved of the responsibility for the specific requirements of the Contract Documents even though the subject submittal was approved by the Architect. The Contractor shall not be relieved of responsibility for the contractor’s, subcontractor’s or vendor’s errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect’s approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect’s approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, professional who shall have and maintain reasonable limits of insurance, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 Services provided by the Architect to evaluate Contractor product substitution requests or to review shop drawings or other project submittals which are required to be submitted more than three (3) times shall be paid for by the Contractor to the Owner.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.
§ 3.13.2 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

§ 3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

§ 3.13.4 The Contractor shall only use specifically assigned areas for parking, storage of materials, and construction operations unless other areas are authorized by the Owner. The Contractor shall comply with any and all local, municipal and state regulations regarding use of and parking on public streets. Access to the site/building will be through Owner approved paths.

§ 3.14 CUTTING AND PATCHING
§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor’s consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP
§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. Upon completion of the Work, on a regular basis, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about the Project. Immediately prior to the Architect’s inspection for Substantial Completion, the Contractor shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed, and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stains, spots, dust marks, and smears shall be removed from all surfaces. Hardware and all metal surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the Contractor at the Contractor’s expense.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.15.3 All areas of new or existing construction which are damaged during the Project shall be restored to their original condition by the Contractor responsible for said damage or disturbance.

§ 3.15.4 The Contractor shall be responsible for temporary site and building dust and dirt control through the use of temporary enclosures, partitions, site watering, calcium chloride or other approved means.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are
contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, its officers, directors, shareholders, trustees, affiliates, insurers, agents, Architect, Architect’s consultants, and agents and employees of any of them from and against any and all claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers’ compensation acts, disability benefit acts or other employee benefit acts.

§ 3.18.3 The Contractor's indemnity obligations under this Section 3.18 shall, but not by way of limitation, specifically include, without limitations, all fines, penalties and punitive damages arising out of, or in connection with, any (i) violation of or failure to comply with any governmental requirements by the Contractor or Architect or any person or entity for whom the Contractor is responsible, (ii) method of execution of the Work, or (iii) failure to obtain, or violation of, any permit or other approval of a public authority applicable to the Work by the Contractor or any entity for whom the Contractor is responsible.

§ 3.18.4 In the event that the Contractor fails or refuses to indemnify any indemnitee hereunder, in addition to all other obligations and upon adjudication in favor of an indemnitee, Contractor shall be responsible for any and all costs associated with the Owner compelling the Contractor to comply with its obligations.

§ 3.19 COMMISSIONING

§ 3.19.1 The Contractor will provide access to the Work as well as support and coordination to the Owner for the commissioning activities as described in Section 2.6.

§ 3.19.2 Any and all deficiencies identified during the commissioning process will be the responsibility of the Contractor to correct or complete in order to comply with and fulfill the requirements of the Contract Documents. These deficiencies must be corrected or completed as a condition for the issuance of the final Certificate for Payment.

§ 3.19.3 The requirements of the Contractor to support the Owner's commissioning process may include 1) balancing reports of mechanical systems approved by the Architect; 2) provision and coordination of training as required by the Contract Documents; 3) cooperation of Contractor's personnel with the Owner's commissioning personnel; 4) access to specific equipment or portions of the Work; 5) provision of systems and equipment documentation; and 6) provision of Operations and Maintenance ARTICLE Manuals.
ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect and Owner will provide administration of the Contract as described in the Contract Documents and will be on the Architect and Owner's Representative will be the Owner’s representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect and Owner will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, neither the Architect nor Owner will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect and Owner will have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not Neither the Architect nor Owner will be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect and Owner will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect. Owner's Representative about matters arising out of or relating to the Contract. Communications by and with the Architect’s consultants shall be through the Architect. Communications between the Architect and Contractor shall be confirmed in writing to the Owner's Representative. Communications between Owner's Representative and Contractor shall be confirmed in writing to the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect and Owner have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect or Owner considers it necessary or advisable, the Architect and Owner will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect or Owner nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the
Architect or Owner to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept and intent expressed in the Contract Documents. The Architect’s action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.8.1 The architect will evaluate substitutions proposed by the contractor, whether as part of a cost reduction procedure or as otherwise, which are prepared and submitted in accordance with the requirements of subparagraphs 3.4.2. Such evaluation and any action taken by the architect with respect thereto shall be performed within 14 calendar days, or as requested in writing, as may, in the architect’s professional judgment be required to permit adequate review. The Owner shall evaluate and approve or take other appropriate action upon contractor proposed substitutions and the architect’s recommendations with respect thereto, which evaluation shall include, but not be limited to, a review of the total net change to project cost, taking into account the proposed change to the construction cost, the possible additional services costs of the architect, and the possible change in the contract sum, the contract time, or the requirements of the contract documents as a result of an Owner approved substitution shall be reflected in a change order.

§ 4.2.9 The Architect and Owner will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner’s review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect’s responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 The Architect may, as the Architect judges desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be affected by field order, or notice to the Contractor, and provided such drawings or instructions are reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings or instructions without additional cost or extension of Contract Time. If the Contractor claims additional cost or time on account of such additional drawings or instructions, it shall give notice provided in Section 15. Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and
Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith. The Architect shall not be required to render interpretations the sole or primary purpose of which is the resolution of jurisdictional disputes between Contractor and Subcontractor or between Subcontractor and Subcontractor.

§ 4.2.12 Interpretations of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings.

§ 4.2.13 The Architect’s Owner’s decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon fourteen (14) calendar days or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. The issuance of additional Drawings or Specifications shall not, in itself, serve as a basis for adjustment of cost or time.

ARTICLE 5  SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after but no later than _______ award of the Contract, shall furnish in writing to the Owner through the Architect and the Architect concurrently the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires and Owner require additional time for review. Failure of the Owner or and Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.
§5.3.2 All subcontracts shall be in writing and shall specifically provide that the Owner is an intended third-party beneficiary.

§ 5.3 SUBCONTRACTUAL RELATIONS
§ 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.2 Any entity other than the Contractor (i.e. subcontractors, vendors, suppliers, etc.) shall not have the right to require mediation, arbitration, or litigation of any dispute in those cases in which the Owner is a party or in which the outcome could affect the Contract Sum or the Contract Time, except at the sole discretion of the Owner.

§ 5.3.3 All subcontracts shall be in writing and shall specifically provide that the Owner is an intended third-party beneficiary.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS
§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension. Each subcontract shall specifically provide that the Owner shall only be responsible to the subcontractor for those obligations of the Contractor that accrue subsequent to the Owner’s exercise of any rights under this conditional assignment.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
§ 6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS
§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those
§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 Unless otherwise required in the Contract Documents, the Owner shall provide for coordination of the activities of the Owner’s own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner’s own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated unless mutually agreed otherwise by Owner and Contractor.

in Article 3, this Article 6 and Articles 10, 11 and 12. § 6.1.5 The Owner reserves the right of access to any part of the project at all times to inspect the same or to install other work either with its own forces or with separate contractors hired by the Owner. Such access is not to be construed to mean partial occupancy by the Owner and no claim for increase in the Contract Time or Sum will be considered unless such Owner’s contractors have delayed or damaged the Contractor’s Work. The Contractor shall permit the Owner to place and install as much furniture, equipment and other material during the progress of the Work as is possible before completion of the various parts of the Work and agrees that such placing and the installation of equipment shall not in any way evidence the completion or acceptance of the Work or any portion of it.

§ 6.2 MUTUAL RESPONSIBILITY
§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor’s construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner’s or separate contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor’s delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.2.5.1 If a separate contractor sues or initiates a mediation, arbitration or litigation proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor’s expense, and if any judgment or award against the Owner arises portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.
§ 6.2.6 The Contractor shall consult with its subcontractors and other Contractors as soon as possible after execution of the contract to coordinate all work phases in order that the Project as a whole can be completed in a professional and expeditious manner.

§ 6.2.7 If a separate contractor sues or initiates a dispute resolution proceeding against the Owner on account of any damage or delay alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall indemnify, defend and hold the Owner harmless from any damages, costs or expenses.

§ 6.3 OWNER'S RIGHT TO CLEAN UP
If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7   CHANGES IN THE WORK
§ 7.1 GENERAL
§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. The decision as to whether the Change Order Work is executed via a Change Order, Construction Change Directive, or a minor change in the Work is the decision of the Owner.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement signature by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone, and/or the Contractor. Except as permitted in Sections 7.3 and 9.7.2, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order or by Construction Change Directive. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in fact, any unjust enrichment, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 The Contractor's itemized accounts for all expenditures or savings for additions to, or deductions from, the Work in the Contract Documents shall at all times be open to inspection by the Owner and Architect.

§ 7.1.5 Proposed changes in the Work requested during the construction period shall be priced by the Contractor and submitted to the Architect and Owner for review, in such form as the Architect and Owner may require, within ten (10) calendar days following the Contractor's receipt of the request. The Contractor shall promptly revise and resubmit such proposal if the Architect and Owner determine that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors. If required by the Architect or Owner, in order to establish the exact cost of new Work added or previously required Work omitted, the Contractor shall obtain and furnish to the Architect and Owner bona fide proposals from recognized suppliers for furnishing and material included in such Work. Such proposals shall be furnished at the Contractor's expense.

§ 7.1.6 The Contractor's proposal for a change in the Work, (Change Order Request), shall be itemized completely and shall include: Specific number of calendar days for additional time (if applicable); all material costs and quantities accompanied by the original manufacturer invoices; labor wages; unit prices; subcontractor costs; markups; equipment costs, profit, overhead, general conditions, fees, bond costs and approved daily time sheet tickets for work performed under the utilization of labor rates. The Architect's and Owner's refusal to approve a change order therefrom, the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorney’s fees and court or arbitration costs which the Owner has incurred.
or change order request due to the Contractor's lack of itemized backup information shall not be used to substantiate a claim for additional time.

§7.1.7 The methods used in determining the adjustment to the Contract Sum due to the Change in the Work may include those listed in Section 7.3.3 and are at the discretion of the Owner.

§7.1.8 If the method utilized to execute the Change in the Work is based on the labor rates, unit prices and material costs, then actual daily time sheets / tickets, approved by the Superintendent and the Owner, must accompany the Change Order, Construction Change Directive, or minor change in the Work. Not including these actual daily time sheets / tickets, approved by the Superintendent and the Owner, with the Change Order, Construction Change Directive, or minor change in the Work may be cause for their rejection.

§ 7.2 CHANGE ORDERS
§7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:
   .1 The change in the Work;
   .2 The amount of the adjustment, if any, in the Contract Sum; and
   .3 The extent of the adjustment, if any, in the Contract Time.

§7.2.2 Agreement on any Change Order shall constitute a final settlement on all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

§7.2.3 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3 and are at the discretion of the Owner.

§7.2.4 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both addition and credits covering related Work or substitutions involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES
§7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly. The Owner may also by Construction Change Directive order work to be performed that has been interpreted by the Owner or Architect to be part of the Work but is disputed by the Contractor through submission of a Claim.

§7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order or work interpreted by the Owner or Architect to be part of the Contract.

§7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
   .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
   .2 Unit prices and rates stated in the Contract Documents or subsequently agreed upon;
   .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
   .4 As provided in Section 7.3.7.

§7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.
§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Owner and Architect of the Contractor’s agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect and Owner shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount, as determined per Sections 3.5, 3.6 and 3.7 of the modified AIA A701, Instructions to Bidders and the Bid Form. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect and Owner may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

1. Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
2. Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
3. Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
4. Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
5. Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect and Owner will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect and Owner determines, in the Architect’s and Owner’s professional judgment, to be reasonably justified. The Architect’s and Owner’s interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree, the Contractor agrees with a determination made by the Owner and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK
The Architect, with approval from the Owner, has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. The Contractor shall not commence operations on the site prior to the authorized date of commencement unless mutually agreed otherwise by Owner and Contractor.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2.4 If in any Application for Payment the total value of the completed Work in place, as certified by the Architect, is less than 90% of the total value of the Work in place estimated in the Progress Schedule, the Owner may, at the Owner's option, require the Contractor to accelerate the progress of the Work without cost to the Owner by increasing the work force or hours of work, or by other reasonable means approved by the Owner and Architect.

§ 8.2.5 If each of three successive Applications for Payments, as certified by the Architect, indicates that the actual Work completed is less than 90% of the values estimated in the Progress Schedule to be completed by the respective dates, the Owner may, at the Owner's option, treat the Contractor's delinquency as a default justifying the action permitted under Section 14.2.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, fire; unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect and Owner determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect and Owner may determine.

§ 8.3.2 Claims relating to time shall be invalid unless made in strict accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages. Notwithstanding anything to the contrary in the Contract Documents, the Contractor's remedy for any (i) delay in the commencement, prosecution or completion of the Work, (ii) hindrance or obstruction in the performance of the Work, (iii) loss of productivity, or (iv) other similar claims (collectively referred to as "Delays") whether or not such Delays are foreseeable, shall be an extension of time in which to complete the Work if permitted under Section 8.3.1. In the event of a concurrent delay by the Owner, the parties agree to share in proportion to their fault, the direct cost and time associated with said delay. In no event shall the Contractor be entitled to any other remedy or compensation or recovery or any damages, in connection with any Delay, including, without limitation, consequential damages, lost opportunity costs, impact damages or other similar remuneration.

§ 8.3.4 The Contractor hereby agrees that for delay by either party under other provisions of the Contract Documents, the Contractor shall have no claim for damages of any kind against the Owner or the Architect on account of any delay in the commencement of the Work and/or delay or suspension of any portion of the Work, whether such delay is caused by the Owner, the Architect, or otherwise, other than as set forth in this Section. In the event of a delay, the Contractor may submit a claim pursuant to Section 4.3 to recover from the Owner the Contractor's general
conditions costs, equipment storage costs, increased direct costs of performance, demobilization and remobilization costs and other direct and unavoidable costs incurred during the period of such delay, but only to the extent delay is not caused by the Contractor. Contractor shall not be entitled to recover any consequential damages including, by way of example, interest on working capital, unabsorbed home office overhead or lost opportunity costs.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM
The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, Architect and Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect and Owner may require. This schedule, unless objected to by the Architect, Architect or Owner, shall be used as a basis for reviewing the Contractor’s Applications for Payment. The description of the Work shall be sufficiently broken down to indicate labor and material costs associated with each area of Work. Any breakdown that fails to include sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work, will be rejected. The Schedule of Values shall be revised if later determined by the Owner or Architect to be inaccurate.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, In order to expedite monthly payments during the course of the Project, the Contractor shall prepare for the Architect's and Owner's review a preliminary draft of the Application for Payment (pencil copy), approximately ten (10) days before the end of each month. The payment period shall conclude on the last of that month. Then, five (5) days before the end of each month the Contractor shall have made mutually agreed modifications of the pencil copy and the Contractor shall submit to the Architect and Owner for approval an itemized Proposed Final Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, notarized. The Contractor shall utilize and submit AIA G702 and G703, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders. Payments for changes in the Work which have not been formally approved in a Change Order, shall not be included.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 The Application for Payment will reflect the amount due to the Contractor for the cost of the Work less retainage as determined in the Owner-Contractor Agreement.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.2.1 In addition, for consideration of payment for stored products:
(a) Storage shall be agreed upon in advance prior to shipment;
(b) Location of storage shall be agreed upon in advance;
(c) Contractor shall be responsible for, and pay costs of, the verification and inspection of storage;
(d) Insurance certificate required for stored items; and
(e) Bill of sale from supplier to verify transfer of goods to the Owner.

§ 9.3.2 Schedule of Values and Construction Schedule will be considered in decision on any specific request for payment for storage.

§ 9.3.2.3 Payment for material and equipment delivered and stored shall not relieve Contractor of responsibility for furnishing equipment and material required for the Work in the same manner as if such payment were not made.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor’s knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.3.4 To the extent payment has been made by the Owner for amount due, Contractor hereby expressly waives, releases and relinquishes any and all right to maintain, or have filed or maintained, any mechanic's lien or claim against the aforesaid premises, or any part thereof, or any building or buildings thereon, for or on account of any work, labor and materials performed or furnished under this Agreement, and agrees that no such lien or claim shall be so filed or maintained by or on behalf of Contractor; and Contractor further agrees to save the Owner harmless from the lien or claim of liens against the aforesaid premises or any part thereof, or any buildings thereon, of any subcontractor, or any persons acting through or under the Contractor and agrees, that if at any time there shall be any evidence of the filing or maintenance of any such lien or claim for liens, the Owner shall have the right to deduct from the amount otherwise due to the Contractor hereunder, an amount sufficient to indemnify it for any or all loss or damages which may result from such lien or claim; and the Contractor further agrees that this waiver shall be an independent covenant, and shall be effective, not only with respect to materials furnished or labor performed under any Agreement supplemental to this principal Agreement and under any Agreement for extra labor or materials for the above described premises and buildings.

§ 9.3.4.1 Each Application for Payment or periodic estimate requesting payment shall be accompanied by a waiver of lien on account of prior payments from each Subcontractor. This waiver of lien shall include the dollar amount that the Subcontractor has been paid to date.

§ 9.3.4.2 Each Application for Payment or periodic estimate requesting payment shall be accompanied by a statement from each Contractor and Subcontractor certifying that there are no delay claims for the period being paid.

§ 9.3.5 To the extent payment has been made by the Owner for amounts due, Owner shall be entitled to withhold payment to Contractor upon receipt of notice of any intent to file a lien in an amount sufficient to protect the interests of the Owner. Owner shall allow Contractor a reasonable opportunity to bond off a lien. Owner shall have the right, on its own and without the Contractor's consent, to resolve any lien claims and deduct the costs thereof from any amounts due Contractor. In the event sufficient funds are not due Contractor, Contractor shall immediately pay to Owner any sums paid by Owner to resolve lien claim(s) upon demand.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven five days after receipt of the Contractor’s Final Monthly Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect and Owner determines is properly due, or notify the Contractor and Owner in writing of the Architect’s reasons for withholding certification in whole or in part as provided in Section 9.5.1.
§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect’s evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect’s knowledge, information and belief, professional judgment, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor’s right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect’s opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect’s opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
.7 repeated failure to carry out the Work in accordance with the Contract Documents.
.8 failure to maintain specified record documents relating to the Work;
.9 failure to provide lien waivers as required herein; or
.10 failure to provide response to on-going construction commissioning reports.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment. In no event shall joint payment create any obligations or contracts between Owner and a Subcontractor or supplier or create any rights in such Subcontractor or supplier against the Owner.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.
§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor’s portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven fourteen (14) additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.7.2 Notwithstanding anything to the contrary, in no event shall the Contractor stop the Work in connection with any withholding or payment for an item or failure to make payment relating to an item made in connection with a good faith dispute.

§ 9.7.3 LIENS

(a) If any subcontractor, vendor, or any other party for whom the Contractor is responsible files any lien against the Project and/or the Project site, the Contractor shall discharge such lien within fifteen (15) calendar days of the Contractor’s learning of such lien, unless the Owner requests that the Contractor obtain a lien discharge bond in which case the Contractor shall obtain within the same fifteen (15) calendar day period, at no cost to the Owner, a lien discharge bond for which both the surety and the form of bond are acceptable to the Owner. (b) If the Contractor fails to discharge such lien (or, if requested by the Owner, fails to obtain a lien discharge bond acceptable to the Owner) within such fifteen (15) calendar day period, the Owner shall have the right to withhold from the next progress payment or any other sum payable to the Contractor an amount equal to one hundred and fifty percent (150%) of the total of (i) the amount of such lien plus (ii) reasonable costs and expenses the Owner may incur.
related to such lien. The Owner may either: (1) apply amounts so withheld to discharging such lien and paying the costs and expenses for such discharge; or (2) retain such amounts (including amounts for costs and expenses) until such liens are discharged by the Contractor, thereafter crediting to the Contractor any amounts remaining after payment of the costs and expenses the Owner incurs related to such lien. (c) The Contractor shall defend, indemnify, and hold harmless the Owner from all costs and expenses incurred by the Owner in connection with such liens, unless and to the extent that such liens are the result of the Owner’s failure to make timely payment of amounts due to the Contractor in accordance with the requirements of the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when (1) the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Documents; (2) the Owner can occupy or utilize the Work for its intended use; (3) the issuance of a formal Certificate of Occupancy by the authority having jurisdiction; (4) the premises have been cleaned as per Section 3.15; and (5) only minor items remain to be corrected or completed that have no significant interference with the Owner’s use of the Work.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof designated in the Contract Documents for separate completion which the Owner agrees to accept separately, is substantially complete, as defined in Section 9.8.1 above, the Contractor shall notify the Architect and Owner in writing and shall prepare and submit to the Architect (1) a comprehensive list of items to be completed or corrected prior to final payment, and 2) all Certificates of Occupancy and applicable permits required by the Contract Documents, endorsed by the Contractor and in a form reasonably acceptable to the Architect and Owner. Promptly after receiving such notice, the Architect will conduct a preliminary review to determine whether or not the Documents are generally complete and correct. If the Architect finds on the basis of this review that the Contractor’s notice and supporting documents are not generally complete or correct, the Architect will return them to the Contractor for revision and resubmittal, describing in general the additions or corrections required. If the Architect finds on one preliminary review of the Contractor’s resubmittal that the resubmitted notice and supporting documents are still not generally complete and correct, the Contractor shall again correct and resubmit them, and shall, in addition, reimburse the Owner for the cost of any change in the Architect’s services resulting from such a second and any subsequent preliminary reviews. When the Architect finds on the basis of a preliminary review that the Contractor’s notice and supporting documents are substantially complete, the Architect will proceed as stated in Section 9.8.3 below. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor’s list, the Architect and Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect’s or Owner’s inspection discloses any item, whether or not included on the Contractor’s list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. Architect or Owner. In such case, the Contractor shall then submit a request for another inspection by the Architect or Owner to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. This list will be comprised of all items identified by the Contractor, Architect and Owner. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof in accordance with Section 9.8.6. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.
§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor, or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor’s written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect’s knowledge, information and belief, professional judgment, and on the basis of the Architect’s on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect’s final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor’s being entitled to final payment have been fulfilled. All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner prior to submission of the final Application for Payment. The final payment will not be made by the Owner until all close-out documents including as-built documents, operation and maintenance manuals, training and any other requirements identified in the Contract Documents have been received and accepted by the Owner and provided in the media and format requested by the Owner.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect and Owner (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5) other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Owner will release such retainage within thirty (30) days after the date of issuance of a Certificate of Substantial Completion by the Architect. The Owner will continue to hold retainage in an amount of one hundred fifty percent (150%) of the estimated cost of incomplete or unsatisfactory work. Further, the Owner will consider a reduction of retainage on a trade-by-trade (subcontractor-by-subcontractor) basis based upon their satisfactory progress and/or substantial completion of their Work prior to project Substantial Completion.
Contractor may, at the Owner’s option, require the Contractor to furnish a bond satisfactory to the Owner, as a condition of final payment and to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms and the Owner so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.3.1 If after one hundred-twenty (120) calendar days after Substantial Completion of the Work, or as otherwise stated in the Owner-Contractor Agreement, Final Completion thereof is not achieved due to actions or inaction of the Contractor, the Contractor shall reimburse the Owner for any and all costs incurred by the Owner for professional fees, including those of the Architect and Owner’s Representative.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents; or
.3 terms of special warranties required by the Contract Documents;
.4 latent defects.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS
The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Owner assumes no responsibility or liability for the safety of the Project site. Contractor shall be solely responsible for providing a safe place for the performance of the Work.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor’s Subcontractors or Sub-subcontractors; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.
§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor’s obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor’s organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.9 The Contractor shall, within five (5) business days, report in writing to the Owner and Architect all accidents out of or in connection with the Work that caused death, personal injury or property damage, giving names of those involved and any witnesses.

§ 10.2.10 The Contractor shall be responsible for the adequate strength and safety of all scaffolding, staging and hoisting equipment and for temporary shoring, bracing and tying.

§ 10.2.11 The Contractor shall, at all times, be responsible for maintaining fire safety on the site, including prompt removal of all combustible rubbish, provision of fire extinguishing apparatus, and other measures, and/or services specified herein or required by the State Fire Marshal or other authority having jurisdiction. If such authority determines that the Contractor has failed to provide or maintain adequate fire safety, the Contractor shall, at its own expense, provide any compensatory services, equipment or devices required by the authority having jurisdiction, including but not limited to maintaining a continuous fire watch.

§ 10.2.12 Cutting and welding to be performed in or immediately adjacent to existing spaces shall not be performed without written approval of the Owner for each instance.

§ 10.2.13 The Contractor shall comply with the requirements of the Occupational Safety and Health Act and the Construction Safety Act of 1969, including all standards and regulations which have been promulgated by the governmental authorities which administer such Acts and said requirements, standards and regulations are incorporated herein by reference. The Contractor shall be directly responsible for compliance therewith on the part of its agents, employees, subcontractors, and material suppliers and shall directly receive and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of its agents, employees, material suppliers or subcontractors, to so comply.

§ 10.2.14 The Contractor shall at all times protect excavations, trenches, buildings, and materials from rain water, ground water, ice, snow, back-up or leakage of sewers, drains, or other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall operate all pumps, piping and other equipment necessary to this end.
§10.2.15 The Contractor shall remove snow or ice within the limits of the Work indicated in the Contract Documents which might result in damage or delay.

§10.2.16 During the progress of the Work and at all times prior to the Date of Substantial Completion or occupancy of the Work by the Owner, whichever is earlier, the Contractor shall provide temporary heat, ventilation, and enclosure adequate to permit the Work to proceed in a timely fashion, and to prevent damage to completed Work or work in progress, or to materials stored on the premises. The permanent heating and ventilation systems may be used for these purposes when available unless otherwise provided in the Contract Documents. The use of the permanent heating system for temporary heat shall be subject to the prior written approval of the Owner and Architect.

§10.2.17 The Contractor shall be responsible for protecting the Work, materials and equipment at all times from commencement of Work until completion of its Work. It may, if it wishes, employ watchmen to assure such protection.

§10.2.18 In case of an emergency involving danger to life or property, the Contractor may act at its discretion to prevent injury or damage to the threatened life or property.

§10.2.19 The Contractor shall maintain its hand tools, machinery, personnel protective equipment, etc. in safe operating condition and shall require its subcontractors and individual mechanics to maintain their equipment in the same condition.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately—may be extended if appropriate and the Contract Sum shall be increased in the amount of the Contractor’s reasonable additional costs, if any, of shut-down, delay and start-up.

§10.3.2.1 If Hazardous Material is determined to be present on the site, the Contractor will cooperate with the Owner and the Owner's consultants and contractors to coordinate the Work in conjunction with the abatement, handling, disposal, or other procedures related to the presence of the Hazardous Material to maintain a safe working environment and to progress with the execution of the Work to avoid delay.

§10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to reasonable attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.
§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner, defend and hold harmless for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers’ compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor’s employees or persons or entities excluded by law from the requirements of Article 11.1.1.1, but required by the Contract Documents to be insured;
.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor’s employees;
.4 Claims for damages insured by usual personal injury liability coverage;
.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor’s obligations under Section 3.18.

Such coverage shall be maintained for no less than four (4) years following final payment. The Owner shall be named additional insureds. Contractor shall provide a Blanket Additional Insured Endorsement. Contractor shall provide Owner with evidence of workers' compensation coverage.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents, but under no circumstances for less than two years from the date of final payment.
§ 11.1.2.1 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X-C/U as applicable),

2. Independent Contractors’ Protective,

3. Products and Completed Operations,

4. Personal Injury Liability with Employment Exclusion deleted,

5. Contractual - including specified provision for Contractor’s obligation under Section 3.18,

6. Owned, non-owned and hired motor vehicles,

7. Broad Form Property Damage including Completed Operations,

8. Umbrella Excess Liability,

9. If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Section 9.10.2.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s consultants as additional insureds; Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

§ 11.1.5 The limits specified in the contract documents are minimum requirements and shall not be construed in any way as limits of liability or as constituting acceptance by Owner of responsibility for losses in excess of such limits. The Contractor shall be responsible for all deductibles applicable to any insurance. No acceptance and/or
The contractor shall provide a Blanket Additional Insured Endorsement and shall provide Owner with evidence of worker’s compensation coverage.

§ 11.1.6 The Contractor shall not commence the Work under the Contract nor permit any subcontractor to commence work on a subcontract until all the insurance required is obtained. The Contractor may carry, at its own expense, such additional coverage as it may deem necessary. The Contractor shall not be deemed to be relieved of any responsibility by the fact it carries insurance. Should the Contractor at any time neglect or refuse to provide the insurance required herein or should such insurance be cancelled, or should the full annual aggregate or any policy not be available to satisfy the requirements of the Contract, the Owner shall have the right to procure such insurance and the cost thereof shall be deducted from monies then due or thereafter to become due the Contractor.

§ 11.2 OWNER'S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

§ 11.3 PROPERTY INSURANCE
§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an “all-risk” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner party initiating the claim shall pay costs not covered because of such deductibles. Notwithstanding, if the cause of any loss payment under such insurance is the fault of the Contractor, then Contractor shall pay such deductible.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or approval of any insurance by Owner shall be construed as relieving or excusing Contractor from any liability or obligation imposed by the provisions of the Contract Documents.
otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.1.6 Time Limits on Claims.
Claims made by any party must be initiated within 30 calendar days after occurrence of the event giving rise to such Claim or within 30 calendar days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to the Owner’s Representative and the Surety.

§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused, to the extent of actual recovery of any insurance proceeds obtained pursuant to this Section.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages. If requested by the Contractor, the Owner shall provide proof of insurance coverage required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days’ prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.
§ 11.3.8 A loss insured under the Owner’s property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner’s duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner’s exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract. The surety, form and substance of the bond shall be satisfactory to the Owner. Surety companies executing bonds must appear on the Treasury Department’s most current list (Circular 570, as amended) and be authorized to transact business in the state in which the Project is located.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect’s or Owner’s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, Architect or Owner, be uncovered for the Architect’s or Owner’s examination and be replaced at the Contractor’s expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect or Owner has not specifically requested to examine prior to its being covered, the Architect or Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner’s expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor’s expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or Owner, or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect’s services and expenses
made necessary thereby, and any cost, loss or damage to the Owner resulting therefrom, shall be at the Contractor’s expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor’s obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period thirty (30) calendar days after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2. Upon completion of any Work under or pursuant to this Section 12.2, the one-year correction period in connection with the Work requiring correction shall be renewed and recommence.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor’s correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such equitable, even if such Work was installed as submitted and approved in shop drawings, such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13   MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of
the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES
§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to engaged by the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Owner will hire and pay for services as outlined in Section 2.2.6, from which reports will be forwarded to the Contractor. The Contractor shall give the Architect and Owner timely notice of when and where tests and inspections are to be made so that the Architect may be present for and Owner may observe such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect and Owner of when and where tests and inspections are to be made so that the Architect may be present for and Owner may observe such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner’s expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect’s services and expenses shall be at the Contractor’s expense, including testing and costs related to remedial work.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.
§ 13.5.7 The Owner shall have the right to conduct testing and inspections related to, but not limited to, commissioning as outlined in Section 2.6 and 3.19.

§ 13.6 INTEREST
Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:
.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor’s request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, direct costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE
§ 14.2.1 The Owner may terminate the Contract if the Contractor
.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.
§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this reviewed by the Architect. This obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine. In said event, the Owner shall equitably adjust the Contract Sum and Contract Time, if warranted.

§ 14.3.2 The Contract Sum and Contract Time shall may be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed. Upon such termination, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions. The contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, overhead anticipated and/or unearned profits, consequential or indirect damages.
ARTICLE 15  CLAIMS AND DISPUTES
§ 15.1 CLAIMS
§ 15.1.1 DEFINITION
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party Architect. Claims by the Contractor must be initiated within 21 days after occurrence of the event giving rise to such Claim or Claim. Claims by the Owner must be initiated within 21 days after the claimant Owner first recognizes the condition giving rise to the Claim, whichever is later. Claim. After a Change Order Request or a formal Change Order has been executed, no additional Claim based on the same scope of work will be considered.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. Owner shall have no obligation to make payments to the Contractor on or against such claims, disputes, or other matters in question during the pendency of any mediation, arbitration, or other proceedings to resolve such matters. Owner shall continue to make payments of undisputed amounts.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME
§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary as per Article 8.3.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction as per Article 8.3.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES
The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISIONINTERPRETATION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision Architect for initial interpretation. An initial interpretation shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker Architect and all affected parties agree, the Initial Decision Maker Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker Architect will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve recommend approval of the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker Architect is unable to interpret the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker Architect concludes that, in the Initial Decision Maker’s Architect’s sole discretion, it would be inappropriate for the Initial Decision Maker to resolve. If the Initial Decision Maker is unable to interpret the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker Architect in rendering an initial interpretation. The Architect may request the Owner to authorize retention of such persons at the Owner’s expense.

§ 15.2.4 If the Initial Decision Maker Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker Architect when the response or supporting data will be furnished or (3) advise the Initial Decision Maker Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker Architect will either reject or approve recommendation of the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision Architect will render an initial interpretation or indicate that the Architect is unable to interpret the Claim. This initial interpretation shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties interpretation shall be considered by the parties, but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.
§ 15.2.6 Either party may file for mediation of an initial decision interpretation at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision. party may file for mediation.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor’s default, the Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic’s lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 9.10.5 and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION
§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.
§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent. Any unresolved claims between Owner and Contractor, Owner and Architect, Contractor and Architect, Contractor and its Surety, or Contractor and its Subcontractors or Suppliers may be submitted for arbitration as provided in this Section 15 and any or all of the parties named above shall, at the Owner’s request, be joined or consolidated therein.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.
Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO: « »
ADDRESS: « »

SUBMITTED BY: « »
NAME: « »
ADDRESS: « »

PRINCIPAL OFFICE: « »
[ « ] Corporation
[ « ] Partnership
[ « ] Individual
[ « ] Joint Venture
[ « ] Other « »

NAME OF PROJECT: (if applicable) « »

TYPE OF WORK: (file separate form for each Classification of Work)
[ « ] General Construction
[ « ] HVAC
[ « ] Electrical
[ « ] Plumbing
[ « ] Other: (Specify) « »

§ 1 ORGANIZATION
§ 1.1 How many years has your organization been in business as a Contractor? « »

§ 1.2 How many years has your organization been in business under its present business name? « »

§ 1.2.1 Under what other or former names has your organization operated? « »

§ 1.3 If your organization is a corporation, answer the following:
§ 1.3.1 Date of incorporation: « »
§ 1.3.2 State of incorporation: « »
§ 1.3.3 President's name: « »
§ 1.3.4 Vice-president's name(s) « »
§ 1.3.5 Secretary's name: « »
§ 1.3.6 Treasurer's name: « »

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ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.
§ 1.4 If your organization is a partnership, answer the following:
   § 1.4.1 Date of organization: 
   § 1.4.2 Type of partnership (if applicable): 
   § 1.4.3 Name(s) of general partner(s)
   « »

§ 1.5 If your organization is individually owned, answer the following:
   § 1.5.1 Date of organization: 
   § 1.5.2 Name of owner:
   « »

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:
« »

§ 2 LICENSING
§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.
« »

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.
« »

§ 3 EXPERIENCE
§ 3.1 List the categories of work that your organization normally performs with its own forces.
« »

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)
   § 3.2.1 Has your organization ever failed to complete any work awarded to it?
   « »

   § 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?
   « »

   § 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?
   « »

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)
« »

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.
« »
§ 3.4.1 State total worth of work in progress and under contract:

« »

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

« »

§ 3.5.1 State average annual amount of construction work performed during the past five years:

« »

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

« »

§ 4 REFERENCES

§ 4.1 Trade References:

« »

§ 4.2 Bank References:

« »

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

« »

§ 4.3.2 Name and address of agent:

« »

§ 5 FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:
§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

§ 6 SIGNATURE

§ 6.1 Dated at this «  » day of «  » «  »

Name of Organization: «  »

By: «  »

Title: «  »

§ 6.2

M «  » being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this «  » day of «  » «  »

Notary Public: «  »

My Commission Expires: «  »
Application and Certificate for Payment

TO OWNER: PROJECT:

FROM CONTRACTOR: VIA ARCHITECT:

CONTRACTOR'S APPLICATION FOR PAYMENT
Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM ................................................................. $0.00
2. NET CHANGE BY CHANGE ORDERS .............................................. $0.00
3. CONTRACT SUM TO DATE (Line 1 + 2) .......................................... $0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) .......... $0.00
5. RETAINAGE:
   a. 0% of Completed Work
      (Column D + E on G703) ................................................... $0.00
   b. 0% of Stored Material
      (Column F on G703) ........................................................ $0.00
      Total Retainage (Lines 5a + 5b or Total in Column 1 of G703) ......... $0.00
6. TOTAL EARNED LESS RETAINAGE .................................................. $0.00
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ................................ $0.00
   (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE ................................................................. $0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE
   (Line 3 less Line 6) ....................................................................... $0.00

CHANGE ORDER SUMMARY

<table>
<thead>
<tr>
<th>Change Order Summary</th>
<th>Additions</th>
<th>Deductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total changes approved in previous months by Owner</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total approved this Month</td>
<td>$0.00</td>
<td>$0.00</td>
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<tr>
<td>TOTALS</td>
<td>$0.00</td>
<td>$0.00</td>
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</tbody>
</table>

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: ___________________________ Date: ___________________________

State of: ___________________________
County of: ___________________________
Subscribed and sworn to before me this day of ___________________________

Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT
In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Contractor’s knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ........................................................................... $0.00
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:
By: ___________________________ Date: ___________________________

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.
### AIA Document G703™ – 1992

**Continuation Sheet**


In tabulations below, amounts are in US dollars.

Use Column I on Contracts where variable retainage for line items may apply.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION OF WORK</th>
<th>SCHEDULED VALUE</th>
<th>WORK COMPLETED</th>
<th>MATERIALS PRESENTLY STORED (NOT IN D OR E)</th>
<th>TOTAL COMPLETED AND STORED TO DATE (D + E + F)</th>
<th>% (G +C)</th>
<th>BALANCE TO FINISH (C - G)</th>
<th>RETAINAGE (IF VARIABLE RATE)</th>
</tr>
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<tr>
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</tbody>
</table>

**GRAND TOTAL**

$0.00  $0.00  $0.00  $0.00  $0.00  0.00%  $0.00  $0.00

---

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User Notes: (38BADA65)
I, _______________________________ of _______________________________

Officer, Owner, Authorized Rep.  Company Name

do hereby certify that the _______________________________

Company Name

______________________________
Street

______________________________
City

and all of its subcontractors will pay all workers on the

______________________________
Project Name and Number

______________________________
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is

attached hereto).

______________________________
Signed

Subscribed and sworn to before me this __________ day of ________________, _____.

______________________________
Notary Public

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): ___________________
By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

### CLASSIFICATION

<table>
<thead>
<tr>
<th>Classification</th>
<th>Hourly Rate</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, &amp; finishes to all types of mechanical systems; application of firestopping material for wall openings &amp; penetrations in walls, floors, ceilings)</td>
<td>38.25</td>
<td>27.96</td>
</tr>
</tbody>
</table>

1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 7**

| 1c) Asbestos Worker/Heat and Frost Insulator | 40.21 | 29.30 |

*As of: Thursday, July 18, 2019*
<table>
<thead>
<tr>
<th>Trade</th>
<th>Rate</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) Boilermaker</td>
<td>38.34</td>
<td>26.01</td>
</tr>
<tr>
<td>3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons</td>
<td>34.72</td>
<td>32.55 + a</td>
</tr>
<tr>
<td>3b) Tile Setter</td>
<td>34.90</td>
<td>25.87</td>
</tr>
<tr>
<td>3c) Terrazzo Mechanics and Marble Setters</td>
<td>31.69</td>
<td>22.35</td>
</tr>
<tr>
<td>3d) Tile, Marble &amp; Terrazzo Finishers</td>
<td>26.70</td>
<td>21.75</td>
</tr>
<tr>
<td>3e) Plasterer</td>
<td>33.48</td>
<td>32.06</td>
</tr>
</tbody>
</table>

*As of: Thursday, July 18, 2019*
Project: H. Smith Richardson Clubhouse Rebuild

-----LABORERS-----

4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.

4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).

4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).

4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.

4d) Group 5: Air track operator, sand blaster and hydraulic drills.

As of: Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

4e) Group 6: Blasters, nuclear and toxic waste removal.  33.75  20.84

4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).  31.75  20.84

4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.  29.03  20.84

4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.  28.49  20.84

4i) Group 10: Traffic Control Signalman  18.00  20.84

5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Vinyl Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.  33.53  25.66

As of: Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

5a) Millwrights 34.04 26.09

6) Electrical Worker (including low voltage wiring) (Trade License required: 39.62 27.25+3% of gross wage
E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)

7a) Elevator Mechanic (Trade License required: R-1,2,5,6) 53.37 33.705+a+b

-----LINE CONSTRUCTION-----

Groundman 26.50 6.5% + 9.00

Linemen/Cable Splicer 48.19 6.5% + 22.00

As of: Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

8) Glazier (Trade License required: FG-1,2)  
   37.18  21.05 + a

9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection  
   36.67  35.77

----OPERATORS----

Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)  
   40.97  24.80 + a

Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)  
   40.64  24.80 + a

Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)  
   24.80 + a

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Project: H. Smith Richardson Clubhouse Rebuild

Group 4:  Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).

39.48  24.80 + a

Group 5:  Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24” Mandrell)

38.87  24.80 + a

Group 5 continued:  Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.

38.87  24.80 + a

Group 6:  Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).

38.55  24.80 + a

Group 7:  Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24” and under Mandrell).

38.20  24.80 + a

Group 8:  Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.

37.79  24.80 + a

As of:  Thursday, July 18, 2019
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Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).

Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.

Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.

Group 12: Wellpoint operator.

Group 13: Compressor battery operator.

Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).

As of: Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.

<table>
<thead>
<tr>
<th>Group</th>
<th>Position</th>
<th>Hourly Rate</th>
<th>Wage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 15</td>
<td></td>
<td>32.99</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 16: Maintenance Engineer/Oiler.

<table>
<thead>
<tr>
<th>Group</th>
<th>Position</th>
<th>Hourly Rate</th>
<th>Wage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 16</td>
<td></td>
<td>32.32</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.

<table>
<thead>
<tr>
<th>Group</th>
<th>Position</th>
<th>Hourly Rate</th>
<th>Wage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 17</td>
<td></td>
<td>36.76</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).

<table>
<thead>
<tr>
<th>Group</th>
<th>Position</th>
<th>Hourly Rate</th>
<th>Wage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 18</td>
<td></td>
<td>34.26</td>
<td>24.80 + a</td>
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</tbody>
</table>

------PAINTERS (Including Drywall Finishing)------

<table>
<thead>
<tr>
<th>Position</th>
<th>Hourly Rate</th>
<th>Wage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>10a) Brush and Roller</td>
<td>33.62</td>
<td>21.05</td>
</tr>
</tbody>
</table>

As of: Thursday, July 18, 2019
**Project:** H. Smith Richardson Clubhouse Rebuild

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10b) Taping Only/Drywall Finishing</td>
<td>34.37</td>
<td>21.05</td>
</tr>
<tr>
<td>10c) Paperhanger and Red Label</td>
<td>34.12</td>
<td>21.05</td>
</tr>
<tr>
<td>10e) Blast and Spray</td>
<td>36.62</td>
<td>21.05</td>
</tr>
<tr>
<td>11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)</td>
<td>43.62</td>
<td>32.06</td>
</tr>
<tr>
<td>12) Well Digger, Pile Testing Machine</td>
<td>37.26</td>
<td>24.05 + a</td>
</tr>
<tr>
<td>Roofer: Cole Tar Pitch</td>
<td>41.50</td>
<td>17.00 + a</td>
</tr>
</tbody>
</table>

*As of: Thursday, July 18, 2019*
Project: H. Smith Richardson Clubhouse Rebuild

Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing  
40.00  17.00 + a

15) Sheetmetal Worker  (Trade License required for HVAC and Ductwork:  
SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)  
44.74  42.48

16) Pipefitter (Including HVAC work)  
(Trade License required:  S-1,2,3,4,5,6,7,8  B-1,2,3,4  D-1,2,3,4, G-1, G-2, G-8 & G-9)  
43.62  32.06

-----TRUCK DRIVERS-----

17a)  2 Axle  
29.51  24.52 + a

17b)  3 Axle, 2 Axle Ready Mix  
29.62  24.52 + a

As of: Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

17c) 3 Axle Ready Mix  
29.67  24.52 + a

17d) 4 Axle, Heavy Duty Trailer up to 40 tons  
29.72  24.52 + a

17e) 4 Axle Ready Mix  
29.77  24.52 + a

17f) Heavy Duty Trailer (40 Tons and Over)  
29.98  24.52 + a

17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)  
29.77  24.52 + a

18) Sprinkler Fitter (Trade License required: F-1,2,3,4)  
43.92  15.84 + a

As of: Thursday, July 18, 2019
| 19) Theatrical Stage Journeyman | 25.76 | 7.34 |

**As of:** Thursday, July 18, 2019
Project: H. Smith Richardson Clubhouse Rebuild

Welders: Rate for craft to which welding is incidental.
*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.
**Note: Hazardous waste premium $3.00 per hour over classified rate

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
3) Cranes (under 100 ton rated capacity)
   - Crane with 150 ft. boom (including jib) - $1.50 extra
   - Crane with 200 ft. boom (including jib) - $2.50 extra
   - Crane with 250 ft. boom (including jib) - $5.00 extra
   - Crane with 300 ft. boom (including jib) - $7.00 extra
   - Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of: Thursday, July 18, 2019
**Effective October 1, 2005 - Public Act 05-50:** any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

---Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

---

**As of:** Thursday, July 18, 2019
Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

**Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons**

(Building Construction) and

(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

**Elevator Constructors: Mechanics**


b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

**Glaziers**


**Power Equipment Operators**

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year’s Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.
Ironworkers
a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)
a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers
a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters
a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers
(Heavy and Highway Construction & Building Construction)
a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.
STATUTE 31-55a

- SPECIAL NOTICE –

To All State and Political Subdivisions, Their Agents, and Contractors
Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the contractor’s responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor’s Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.
The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- **ASBESTOS WORKERS**

  Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

  Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMakers**

  Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONs, CEMENT FINISHERs, MARBLE MASONs, PLASTERERS, STONE MASONs, PLASTERERS, STONE MASONs, TERRAZZO WORKERS, TILE SETTERS**

  Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.
• **CARPENTERS, MILLWRIGHTS, PILEDRIVERMEN, LATHERS, RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

• **LABORER, CLEANING**

  • The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

• **DELIVERY PERSONNEL**

  • If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

    • An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

• **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. *License required per Connecticut General Statutes: E-1,2  L-5,6  C-5,6  T-1,2  L-1,2  V-1,2,7,8,9.*
• **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. *License required by Connecticut General Statutes: R-1,2,5,6.*

• **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

• **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

• **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

• **INSULATOR**

• Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

• **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).
installation.), hand operated concrete vibrator operator, mason tenders, pipelayers
(installation of storm drainage or sewage lines on the street only), pneumatic drill
operator, pneumatic gas and electric drill operator, powermen and wagon drill
operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

  Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or
application of any protective coatings of every description on all bridges and
appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood
finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all
types of building and residential work.

- **LEAD PAINT REMOVAL**

  - Painter’s Rate
    1. Removal of lead paint from bridges.
    2. Removal of lead paint as preparation of any surface to be repainted.
    3. Where removal is on a Demolition project prior to reconstruction.
  - Laborer’s Rate
    1. Removal of lead paint from any surface NOT to be repainted.
    2. Where removal is on a TOTAL Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

  Installation, repair, replacement, alteration or maintenance of all plumbing, heating,
cooling and piping. *License required per Connecticut General Statutes: P-1,2,6,7,8,9
J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.

- **POWER EQUIPMENT OPERATORS**

  Operates several types of power construction equipment such as compressors, pumps,
hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and
maintains equipment. *License required, crane operators only, per Connecticut General
Statutes.*

- **ROOFERS**

  Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and
gravel to waterproof roofs, including preparation of surface. (demolition or removal of
any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)
• **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

• **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems. *License required per Connecticut General Statutes: F-1,2,3,4.

• **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

• **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. *License required, drivers only, per Connecticut General Statutes.
For example:

• Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
• Hauling material off site is not covered provided they are not dumping it at a location outlined above.
• Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

Any questions regarding the proper classification should be directed to:

Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.
Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)
History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.
THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

If you have QUESTIONS regarding your wages
CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.
Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION
SAFETY AND HEALTH COURSE
(applicable to public building contracts entered into on or after July 1, 2007, where the total cost of all work to be performed is at least $100,000)

(1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);

(2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;

(3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least $100,000;

(4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;

(5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

(6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;

(7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;

(8) Proof of completion may be demonstrated through either: (a) the presentation of a bona fide student course completion card issued by the federal OSHA Training Institute; or (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;

(9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;
Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee’s name first appears;

Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;

Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;

The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;

The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and

Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.

Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of http://www.ctdol.state.ct.us/wgwkstnd/wgmenu.htm; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.
Notice

To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

November 29, 2006

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

**Forklift Operator:**

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

*Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.*

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached “Contracting Agency Certification Form” to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

Inquiries can be directed to (860)263-6543.
CONTRACTING AGENCY CERTIFICATION FORM

I, ___________________________, acting in my official capacity as ___________________________.
authorized representative

for ___________________________, located at ___________________________.
contracting agency

address

do hereby certify that the total dollar amount of work to be done in connection with

______________________________, located at ___________________________.
project name and number

address

shall be $_________________, which includes all work, regardless of whether such project

consists of one or more contracts.

CONTRACTOR INFORMATION

Name:________________________________________

Address:_______________________________________

Authorized Representative:________________________

Approximate Starting Date: ______________________

Approximate Completion Date: _________________

___________________________________________

Signature                                          Date

Return To:  Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: ________________________________
In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

<table>
<thead>
<tr>
<th>CONTRACTOR NAME AND ADDRESS:</th>
<th>SUBCONTRACTOR NAME &amp; ADDRESS</th>
<th>WORKER'S COMPENSATION INSURANCE CARRIER</th>
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<td>PAYROLL NUMBER</td>
<td>Week-Ending Date</td>
<td>PROJECT NAME &amp; ADDRESS</td>
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<th>PERSON/WORKER, ADDRESS and SECTION</th>
<th>APPR. RATE</th>
<th>MALE/FEMALE</th>
<th>WORK CLASSIFICATION</th>
<th>TOTAL ST</th>
<th>BASE HOURLY RATE</th>
<th>TYPE OF FRINGE BENEFITS</th>
<th>GROSS PAY FOR ALL WORK PERFORMED THIS WEEK</th>
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<th>GROSS PAY FOR THIS PREVAILING RATE JOB</th>
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OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL
*FRINGE BENEFITS EXPLANATION (P):*

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

1) Medical or hospital care  
2) Pension or retirement  
3) Life Insurance  
4) Disability  
5) Vacation, holiday  
6) Other (please specify)

**CERTIFIED STATEMENT OF COMPLIANCE**

For the week ending date of ____________________________

I, ____________________________ of ____________________________, (hereafter known as Employer) in my capacity as ____________________________ (title) do hereby certify and state:

**Section A:**

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:
   a) The records submitted are true and accurate;
   b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
   c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
   d) Each such employee of the Employer is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
   e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
   f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such employee’s name first appears.

(Signature)            (Title)                                   Submitted on (Date)

**Section B:** Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

(Signature)            (Title)                                   Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

***THIS IS A PUBLIC DOCUMENT***

***DO NOT INCLUDE SOCIAL SECURITY NUMBERS***
<table>
<thead>
<tr>
<th>PERSON/WORKER, ADDRESS and SECTION</th>
<th>APPR RATE S</th>
<th>MALE/ FEMALE AND RACE*</th>
<th>WORK CLASSIFICATION</th>
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<th>BASE/HOURLY RATE</th>
<th>TYPE OF FRINGE BENEFITS PER HOUR 1 through 6 (see back)</th>
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*IF REQUIRED
NEW CLUBHOUSE

H. SMITH RICHARDSON GOLF COURSE
2425 MOREHOUSE HIGHWAY
FAIRFIELD, CT 06824

S/P+A PROJECT NO. 18.124

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END OF DRAWING LIST
SECTION 011000 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

A. The Work of the Project is defined by the Contract Documents and consists of the demolition of the existing building and construction of new. Work also includes the renovation and addition to the existing Cart Barn.

1.3 CONTRACTOR USE OF PREMISES

A. General: Limit use of the premises to construction activities in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

B. Keep driveways and entrances serving the premises clear and available to the Owner and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

C. Use of the Existing Building (Cart Barn): Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.

1.  Contractor is responsible to secure project area/site from intrusions during unoccupied (after hours) period of time. Any temporary doors and/or window coverings that may be necessary to complete repairs are the Contractors responsibility to furnish and install as part of the project scope.

1.5 SPECIAL REQUIREMENTS

A. The Contractor shall insure that all work performed is done so in a safe manner and that all of his/her employees shall adhere to all applicable safety procedures and practices at all times. There may be children and staff in the vicinity of the work area during normal working hours. The Contractor shall be aware at all times that additional safety considerations should be taken. Particular care shall be taken by the Contractor, Subcontractors and all those in their employ, that all tools, equipment, ladders, etc. are never left unsupervised.

B. Smoking will not be permitted inside the building or on the grounds. Strict adherence to the smoking regulations will be enforced for the entire duration of the construction.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000
SECTIONS 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes administrative and procedural requirements for unit prices.
B. Related Sections:
   1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS
A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES
A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES
A. A list of unit prices is included in the Bid Form.
END OF SECTION 012200
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract. No extensions of time shall be granted for accepted alternates.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. ADD ALTERNATE NO. 1: Flagpole: Add to the Base Bid the labor, material and equipment to provide and install a new ground-set flagpole and associated footing where indicated in the Drawings. Refer to Landscape Drawings and Section 107200 “Flagpole” for additional information.

B. ADD ALTERNATE NO. 2: Folding Panel Doors: Add to the Base Bid the labor, material and equipment to provide and install new folding panel doors in lieu of wood terrace doors at Dining Room 003 and Grill Room 007A as indicated in the Drawings. Work will also include tracks and all associated hardware. Refer to Drawing A103 and Section 084311 “Aluminum-Clad Wood-Framed Folding Glass Storefront” for additional information.

C. ADD ALTERNATE NO. 3: Landscape Lighting: Add to the Base Bid the labor, material and equipment to provide and install new landscape lighting and all associated circuitry as indicated in the Drawings. Refer to Landscape Drawings and Section 265616 “LED Exterior Lighting” for additional information.

D. DEDUCT ALTERNATE NO. 4: Front of Building Asphalt Pavement: Deduct from the Base Bid the provision and installation of concrete walkways at the front of the building and instead include the provision and installation of asphalt pavement walkways in their place. Refer to Civil Drawings and Section 321216 “Asphalt Pavement” for additional information.

E. DEDUCT ALTERNATE NO. 5: Patio Asphalt Pavement – 70: Deduct from the Base Bid the provision and installation of seventy percent (70%) of concrete walkways at the patio and instead include the provision and installation of asphalt pavement walkways in their place. Refer to Civil Drawings and Section 321216 “Asphalt Pavement” for additional information.

F. DEDUCT ALTERNATE NO. 6: Patio Asphalt Pavement – 30: Deduct from the Base Bid the provision and installation of thirty percent (30%) of concrete walkways at the patio and instead include the provision and installation of asphalt pavement walkways in their place. Refer to Civil Drawings and Section 321216 “Asphalt Pavement” for additional information.

G. DEDUCT ALTERNATE NO. 7: Front of Building Curbs: Deduct from the Base Bid the provision and installation of concrete curbs at the front of the building and instead include the provision and installation of bituminous curbs in their place. Refer to Civil Drawings and Section 321216 “Bituminous Concrete Pavement” for additional information.

H. DEDUCT ALTERNATE NO. 8: Exterior Decorative Sconces: Deduct from the Base Bid the provision and installation of exterior decorative electrical sconces in their entirety.

I. DEDUCT ALTERNATE NO. 9: Cart Barn Addition: Deduct from the Base Bid the construction of the Cart Barn addition in its entirety. Work will include the provision and installation of all construction to match that of the opposite site of the Cart Barn. Refer to Architectural Drawings and individual specifications for additional information.
J. **DEDUCT ALTERNATE NO. 10: Cart Barn Elimination:** Deduct from the Base Bid the construction of the Cart Barn addition and all renovations in their entirety. Cart Barn will remain as is.

END OF SECTION 012300
SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Sections:
   1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
   2. Divisions 02 through 49 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
   2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

   1. Substitution Request Form: Use CSI Form 1.5C, 13.1A or comparable form.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
      c. Detailed, SIDE-BY-SIDE comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such
as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of Architects and Owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.


b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.
PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Procurement Substitution Request: Submit to Architect seven (7) days prior to date of bid opening.

B. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Substitution request is fully documented and properly submitted.
   c. Requested substitution will not adversely affect Contractor's construction schedule.
   d. Requested substitution has received necessary approvals of authorities having jurisdiction.
   e. Requested substitution is compatible with other portions of the Work.
   f. Requested substitution has been coordinated with other portions of the Work.
   g. Requested substitution provides specified warranty.
   h. If requested substitution involves more than one (1) contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

C. Substitutions for Convenience: Architect will consider requests for substitution if received within sixty (60) days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   b. Requested substitution does not require extensive revisions to the Contract Documents.
   c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   d. Substitution request is fully documented and properly submitted.
   e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one (1) contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500
SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections:

1. Section 016000 "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request or twenty (20) days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Quotation Form: Use forms acceptable to Architect.
B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to the Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit Price Adjustment: Refer to Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

1.6 CHANGE ORDER PROCEDURES


1.7 CONSTRUCTION CHANGE DIRECTIVE


1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600
SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections:

1. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
4. Section 013300 "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:

   a. Application for Payment forms with continuation sheets.
   b. Submittal schedule.
   c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date but no later than seven (7) days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one (1) line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

   a. Project name and location.
   b. Name of Architect.
   c. Architect's project number.
   d. Contractor's name and address.
PAYMENT PROCEDURES

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

5. Include updated and approved Contractor’s construction schedule, potential Change Order Log and Product Submittal Log.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.

2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:
   a. Materials previously stored and included in previous Applications for Payment.
   b. Work completed for this Application utilizing previously stored materials.
   c. Additional materials stored with this Application.
   d. Total materials remaining stored, including materials with this Application.

F. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One (1) copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
PAYMENT PROCEDURES

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices.
6. Submittal schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
11. Initial progress report.
13. Certificates of insurance and insurance policies.
15. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing one hundred percent (100%) completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Administrative and supervisory personnel.
3. Coordination drawings.
4. Requests for Information (RFIs).
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Sections:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one (1) part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Startup and adjustment of systems.
8. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one (1) entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

   a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
   b. Coordinate the addition of trade-specific information to the coordination drawings by multiple Contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
   c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
   d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
PROJECT MANAGEMENT AND COORDINATION

e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.

4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.

5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. Mechanical and Plumbing Work: Show the following:
   a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
   b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.

7. Electrical Work: Show the following:
   a. Runs of vertical and horizontal conduit 1¼ inch diameter and larger.
   b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.
   c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire Protection System: Show the following:
   a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being
prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.

10. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Section 013300 "Submittal Procedures."

1.6 KEY PERSONNEL

A. Key Personnel Names: Within fifteen (15) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.7 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716 or comparable form.
D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for coordination information already indicated in the Contract Documents.
   d. Requests for adjustments in the Contract Time or the Contract Sum.
   e. Requests for interpretation of Architect's actions on submittals.
   f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within ten (10) days of receipt of the RFI response.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven (7) days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three (3) days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than fifteen (15) days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Construction Administrator, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Tentative construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Lines of communications.
   f. Procedures for processing field decisions and Change Orders.
   g. Procedures for RFI.
   h. Procedures for testing and inspecting.
   i. Procedures for processing Applications for Payment.
   j. Distribution of the Contract Documents.
   k. Submittal procedures.
   l. Preparation of record documents.
   m. Work restrictions.
   n. Working hours.
   o. Owner's occupancy requirements.
   p. Responsibility for temporary facilities and controls.
   q. Procedures for moisture and mold control.
   r. Procedures for disruptions and shutdowns.
   s. Parking availability.
   t. Office, work, and storage areas.
   u. Equipment deliveries and priorities.
   v. First aid.
   w. Security.
   x. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. Review of mockups.
   i. Possible conflicts.
   j. Compatibility problems.
   k. Time schedules.
   l. Weather limitations.
   m. Manufacturer's written recommendations.
   n. Warranty requirements.
   o. Compatibility of materials.
   p. Acceptability of substrates.
   q. Temporary facilities and controls.
   r. Space and access limitations.
   s. Regulations of authorities having jurisdiction.
   t. Testing and inspecting requirements.
   u. Installation procedures.
   v. Coordination with other work.
   w. Required performance results.
   x. Protection of adjacent work.
   y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a Project closeout conference, at a time convenient to Owner and Architect, but no later than thirty (30) days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

   a. Preparation of record documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Submittal of written warranties.
d. Requirements for preparing sustainable design documentation.
e. Requirements for preparing operations and maintenance data.
f. Requirements for demonstration and training.
g. Preparation of Contractor's punch list.
h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
i. Submittal procedures.
j. Installation of Owner's furniture, fixtures, and equipment.
k. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each Contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at required intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
   c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.

2. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100
SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's construction schedule.
2. Daily construction reports.
3. Material location reports.
4. Field condition reports.
5. Special reports.

B. Related Sections:

1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.
CONSTRUCTION PROGRESS DOCUMENTATION

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF electronic file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

C. Daily Construction Reports: Submit at weekly intervals.

D. Material Location Reports: Submit at weekly intervals.

E. Field Condition Reports: Submit at time of discovery of differing conditions.

F. Special Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the Contractor's construction schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Discuss constraints, including phasing, work stages and area separations.
4. Review schedule for work of Owner's separate contracts.
5. Review time required for review of submittals and resubmittals.
6. Review requirements for tests and inspections by independent testing and inspecting agencies.
7. Review time required for completion and startup procedures.
8. Review and finalize list of construction activities to be included in schedule.
9. Review submittal requirements and procedures.
10. Review procedures for updating schedule.
1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than twenty (20) days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than sixty (60) days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
4. Startup and Testing Time: Include not less than fifteen (15) days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than thirty (30) days for punch list and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work Restrictions: Show the effect of the following items on the schedule:
   a. Coordination with existing construction.
b. Uninterruptible services.
c. Use of premises restrictions.
e. Seasonal variations.
f. Environmental control.

3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Subcontract awards.
   b. Submittals.
   c. Purchases.
   d. Mockups.
   e. Fabrication.
   f. Sample testing.
   g. Deliveries.
   h. Installation.
   i. Tests and inspections.
   j. Adjusting.
   k. Curing.
   l. Startup and placement into final use and operation.

4. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Completion of mechanical installation.
   b. Completion of electrical installation.
   c. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
   1. Refer to Section 012900 "Payment Procedures" for cost reporting and payment procedures.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
   1. Unresolved issues.
   2. Unanswered RFIs.
   3. Rejected or unreturned submittals.
   4. Notations on returned submittals.

G. Recovery Schedule: When periodic update indicates the Work is fourteen (14) or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to
working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within seven (7) days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in ten percent (10%) increments within time bar.

2.3 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one (1) day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one (1) week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Construction Administrator, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200
SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Periodic construction photographs.

B. Related Sections:

1. Section 013300 "Submittal Procedures" for submitting photographic documentation.
2. Section 017700 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of eight (8) megapixels, and at an image resolution of not less than 1600 by 1200 pixels and 400 dpi.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
C. Periodic Construction Photographs: Take eighteen to twenty (18-20) photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

D. Additional Photographs: Architect may request photographs in addition to periodic photographs specified.

   1. In emergency situations, take additional photographs within twenty-four (24) hours of request.
   2. Circumstances that could require additional photographs include, but are not limited to, the following:
      a. Immediate follow-up when on-site events result in construction damage or losses.
      b. Substantial Completion of a major phase or component of the Work.

END OF SECTION 013233
SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.


1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making
corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Submit concurrently with Contractor’s construction schedule. Include submittals required during the first sixty (60) days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Format: Arrange the following information in a tabular format:
   
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal Category: Action, informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Architect's final release or approval.
   g. Scheduled dates for purchasing.
   h. Scheduled dates for installation.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals unless requested and Architect’s user agreement properly completed.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

   a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow ten (10) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Resubmittal Review: Allow ten (10) days for review of each resubmittal.
3. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow fifteen (15) days for initial review of each submittal.

D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Name of subcontractor.
   f. Name of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier.

   1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
   i. Number and title of appropriate Specification Section.
   j. Drawing number and detail references, as appropriate.
   k. Location(s) where product is to be installed, as appropriate.
   l. Other necessary identification.

E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Include the following information on an inserted cover sheet:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
SUBMITTAL PROCEDURES

d. Name of Contractor.
e. Name of firm or entity that prepared submittal.
f. Name of subcontractor.
g. Name of supplier.
h. Name of manufacturer.
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Related physical samples submitted directly.
m. Other necessary identification.

5. Include the following information as keywords in the electronic file metadata:

a. Project name.
b. Number and title of appropriate Specification Section.
c. Manufacturer name.
d. Product name.

F. Options: Identify options requiring selection by the Architect.

G. Deviations: Identify deviations from the Contract Documents on submittals.

H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Indication of full or partial submittal.
j. Drawing number and detail references, as appropriate.
k. Transmittal number, numbered consecutively.
l. Submittal and transmittal distribution record.
m. Remarks.
n. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents,
including minor variations and limitations. Include same identification information as related submittal.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files.

2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

4. Test and Inspection Reports Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8½ by 11 inches but no larger than 30 by 42 inches.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one (1) submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
SUBMITTAL PROCEDURES

c. Sample source.
d. Number and title of applicable Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

F. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Section 012900 "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Architects and Owners, and other information specified.

L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

Q. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

S. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements."

T. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

U. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

V. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
W. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Section 017700 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300
SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

1. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor’s quality-control services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances.
Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope construction on-site as freestanding temporary built elements or as part of permanent construction, consisting of multiple products, assemblies and subassemblies.

D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

G. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

J. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
1.5 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two (2) or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

A. Shop Drawings: For mockups.
   1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
   2. Indicate manufacturer and model number of individual components.
   3. Provide axonometric drawings for conditions difficult to illustrate in two (2) dimensions.

B. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems.
   1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
   2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within ten (10) days of Notice to Proceed, and not less than five (5) days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
QUALITY REQUIREMENTS

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory- Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.
1.10 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
QUALITY REQUIREMENTS

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at the Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
   a. Allow seven (7) days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed, unless otherwise indicated.

K. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.

1.11 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
3. Costs for testing that is cancelled will be charged to the Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.


1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.

G. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.

5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

7. Security and protection for samples and for testing and inspecting equipment at Project site.
H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.
3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

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<tr>
<th>Abbreviation</th>
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<tr>
<td>AA</td>
<td>Aluminum Association, Inc. (The)</td>
<td>(703) 358-2960</td>
<td><a href="http://www.aluminum.org">www.aluminum.org</a></td>
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<tr>
<td>AABC</td>
<td>Associated Air Balance Council</td>
<td>(202) 737-0202</td>
<td><a href="http://www.aabchq.com">www.aabchq.com</a></td>
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<td>AAMA</td>
<td>American Architectural Manufacturers Association</td>
<td>(847) 303-5664</td>
<td><a href="http://www.aamanet.org">www.aamanet.org</a></td>
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<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
<td>(202) 624-5800</td>
<td><a href="http://www.transportation.org">www.transportation.org</a></td>
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<td>ACI</td>
<td>American Concrete Institute</td>
<td>(248) 848-3700</td>
<td><a href="http://www.concrete.org">www.concrete.org</a></td>
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<td>AGA</td>
<td>American Gas Association</td>
<td>(202) 824-7000</td>
<td><a href="http://www.aga.org">www.aga.org</a></td>
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<td>AHA</td>
<td>American Hardboard Association (Now part of CPA)</td>
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<td>AI</td>
<td>Asphalt Institute</td>
<td>(859) 288-4960</td>
<td><a href="http://www.asphaltinstitute.org">www.asphaltinstitute.org</a></td>
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<td>AIA</td>
<td>American Institute of Architects (The)</td>
<td>(800) 242-3837</td>
<td><a href="http://www.aia.org">www.aia.org</a></td>
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<td>AISC</td>
<td>American Institute of Steel Construction</td>
<td>(800) 644-2400</td>
<td><a href="http://www.aisc.org">www.aisc.org</a></td>
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<td>AISI</td>
<td>American Iron and Steel Institute</td>
<td>(202) 452-7100</td>
<td><a href="http://www.steel.org">www.steel.org</a></td>
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<td>ALSC</td>
<td>American Lumber Standard Committee, Incorporated</td>
<td>(301) 972-1700</td>
<td><a href="http://www.alsc.org">www.alsc.org</a></td>
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<td>ANSI</td>
<td>American National Standards Institute</td>
<td><a href="http://www.ansi.org">www.ansi.org</a></td>
<td>(202) 293-8020</td>
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<td>APA</td>
<td>APA - The Engineered Wood Association</td>
<td><a href="http://www.apawood.org">www.apawood.org</a></td>
<td>(253) 565-6600</td>
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<td>ARI</td>
<td>Air-Conditioning &amp; Refrigeration Institute</td>
<td><a href="http://www.ari.org">www.ari.org</a></td>
<td>(703) 524-8800</td>
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<td>ARMA</td>
<td>Asphalt Roofing Manufacturers Association</td>
<td><a href="http://www.asphaltroofing.org">www.asphaltroofing.org</a></td>
<td>(202) 207-0917</td>
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<td>ASCE</td>
<td>American Society of Civil Engineers</td>
<td><a href="http://www.asce.org">www.asce.org</a></td>
<td>(800) 548-2723</td>
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<td>ASCE/SEI</td>
<td>American Society of Civil Engineers/Structural Engineering Institute</td>
<td>(See ASCE)</td>
<td>(703) 295-6300</td>
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<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air-Conditioning Engineers</td>
<td><a href="http://www.ashrae.org">www.ashrae.org</a></td>
<td>(800) 527-4723</td>
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<td>ASME</td>
<td>ASME International (American Society of Mechanical Engineers International)</td>
<td><a href="http://www.asme.org">www.asme.org</a></td>
<td>(800) 843-2763</td>
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<td>ASSE</td>
<td>American Society of Sanitary Engineering</td>
<td><a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a></td>
<td>(440) 835-3040</td>
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<td>AWI</td>
<td>Architectural Woodwork Institute</td>
<td><a href="http://www.awinet.org">www.awinet.org</a></td>
<td>(571) 323-3636</td>
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<td>AWPA</td>
<td>American Wood Protection Association (Formerly: American Wood Preservers' Association)</td>
<td><a href="http://www.awpa.com">www.awpa.com</a></td>
<td>(205) 733-4077</td>
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<td>AWS</td>
<td>American Welding Society</td>
<td><a href="http://www.aws.org">www.aws.org</a></td>
<td>(800) 443-9353</td>
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<td>AWWA</td>
<td>American Water Works Association</td>
<td><a href="http://www.awwa.org">www.awwa.org</a></td>
<td>(800) 926-7337</td>
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<td>BHMA</td>
<td>Builders Hardware Manufacturers Association</td>
<td><a href="http://www.buildershardware.com">www.buildershardware.com</a></td>
<td>(212) 297-2122</td>
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<td>BICSI</td>
<td>BICSI, Inc.</td>
<td>(800) 242-7405</td>
<td><a href="http://www.bicsi.org">www.bicsi.org</a></td>
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<td>CDA</td>
<td>Copper Development Association</td>
<td>(800) 232-3282</td>
<td><a href="http://www.copper.org">www.copper.org</a></td>
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<td>CGA</td>
<td>Compressed Gas Association</td>
<td>(703) 788-2700</td>
<td><a href="http://www.cganet.com">www.cganet.com</a></td>
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<td>CISCA</td>
<td>Ceilings &amp; Interior Systems Construction Association</td>
<td>(630) 584-1919</td>
<td><a href="http://www.cisca.org">www.cisca.org</a></td>
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<td>CISPI</td>
<td>Cast Iron Soil Pipe Institute</td>
<td>(423) 892-0137</td>
<td><a href="http://www.cispi.org">www.cispi.org</a></td>
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<td>CPPA</td>
<td>Corrugated Polyethylene Pipe Association</td>
<td>(800) 510-2772</td>
<td><a href="http://www.cppa-info.org">www.cppa-info.org</a></td>
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<td>CRI</td>
<td>Carpet and Rug Institute (The)</td>
<td>(800) 882-8846</td>
<td><a href="http://www.carpet-rug.com">www.carpet-rug.com</a></td>
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<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
<td>(847) 517-1200</td>
<td><a href="http://www.crsi.org">www.crsi.org</a></td>
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<td>CSA</td>
<td>CSA International (Formerly: IAS - International Approval Services)</td>
<td>(866) 797-4272</td>
<td><a href="http://www.csa-international.org">www.csa-international.org</a></td>
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<td>CSI</td>
<td>Construction Specifications Institute (The)</td>
<td>(800) 689-2900</td>
<td><a href="http://www.csinet.org">www.csinet.org</a></td>
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<td>DHI</td>
<td>Door and Hardware Institute</td>
<td>(703) 222-2010</td>
<td><a href="http://www.dhi.org">www.dhi.org</a></td>
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<td>EIA</td>
<td>Electronic Industries Alliance</td>
<td>(703) 907-7500</td>
<td><a href="http://www.eia.org">www.eia.org</a></td>
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<td>EJMA</td>
<td>Expansion Joint Manufacturers Association, Inc.</td>
<td>(914) 332-0040</td>
<td><a href="http://www.ejma.org">www.ejma.org</a></td>
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<td>ESD</td>
<td>ESD Association (Electrostatic Discharge Association)</td>
<td>(315) 339-6937</td>
<td><a href="http://www.esda.org">www.esda.org</a></td>
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<td>FM Approvals</td>
<td>FM Approvals LLC</td>
<td>(781) 762-4300</td>
<td><a href="http://www.fmglobal.com">www.fmglobal.com</a></td>
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<td>FM Global</td>
<td>FM Global (Formerly: FMG - FM Global)</td>
<td>(401) 275-3000</td>
<td><a href="http://www.fmglobal.com">www.fmglobal.com</a></td>
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<td>FSA</td>
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<td><a href="http://www.fluidsealing.com">www.fluidsealing.com</a></td>
<td>(610) 971-4850</td>
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<td>FSC</td>
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<td><a href="http://www.fsc.org">www.fsc.org</a></td>
<td>49 228 367 66 0</td>
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<td>GA</td>
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<td><a href="http://www.gypsum.org">www.gypsum.org</a></td>
<td>(202) 289-5440</td>
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<td>GANA</td>
<td>Glass Association of North America</td>
<td><a href="http://www.glasswebsite.com">www.glasswebsite.com</a></td>
<td>(785) 271-0208</td>
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<td>HI</td>
<td>Hydraulic Institute</td>
<td><a href="http://www.pumps.org">www.pumps.org</a></td>
<td>(973) 267-9700</td>
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<td>HMMA</td>
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<td>HPVA</td>
<td>Hardwood Plywood &amp; Veneer Association</td>
<td><a href="http://www.hpva.org">www.hpva.org</a></td>
<td>(703) 435-2900</td>
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<td>ICEA</td>
<td>Insulated Cable Engineers Association, Inc.</td>
<td><a href="http://www.ieca.net">www.ieca.net</a></td>
<td>(770) 830-0369</td>
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<td>IEC</td>
<td>International Electrotechnical Commission</td>
<td><a href="http://www.iec.ch">www.iec.ch</a></td>
<td>41 22 919 02 11</td>
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<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers, Inc. (The)</td>
<td><a href="http://www.ieee.org">www.ieee.org</a></td>
<td>(212) 419-7900</td>
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<td>IESNA</td>
<td>Illuminating Engineering Society of North America</td>
<td><a href="http://www.iesna.org">www.iesna.org</a></td>
<td>(212) 248-5000</td>
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<td>IGCC</td>
<td>Insulating Glass Certification Council</td>
<td><a href="http://www.igcc.org">www.igcc.org</a></td>
<td>(315) 646-2234</td>
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<td>IGMA</td>
<td>Insulating Glass Manufacturers Alliance</td>
<td><a href="http://www.igmaonline.org">www.igmaonline.org</a></td>
<td>(613) 233-1510</td>
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<td>ISO</td>
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<td><a href="http://www.iso.ch">www.iso.ch</a></td>
<td>41 22 749 01 11</td>
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<td>(202) 293-8020</td>
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<td>MFMA</td>
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<td><a href="http://www.metalframingmfg.org">www.metalframingmfg.org</a></td>
<td>(312) 644-6610</td>
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<td>MPI</td>
<td>Master Painters Institute</td>
<td><a href="http://www.paintinfo.com">www.paintinfo.com</a></td>
<td>(888) 674-8937</td>
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<td>(604) 298-7578</td>
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<td>MSS</td>
<td>Manufacturers Standardization Society of The Valve and Fittings Industry Inc.</td>
<td>(703) 281-6613</td>
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<td>NAAMM</td>
<td>National Association of Architectural Metal Manufacturers</td>
<td>(630) 942-6591</td>
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<td>NACE</td>
<td>NACE International (National Association of Corrosion Engineers International)</td>
<td>(800) 797-6623 (281) 228-6200</td>
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<td>NADCA</td>
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<td>(202) 737-2926</td>
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<td>NAIMA</td>
<td>North American Insulation Manufacturers Association</td>
<td>(703) 684-0084</td>
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<td>NCMA</td>
<td>National Concrete Masonry Association</td>
<td>(703) 713-1900</td>
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<td>NEBB</td>
<td>National Environmental Balancing Bureau</td>
<td>(301) 977-3698</td>
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<td>NECA</td>
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<td>(301) 657-3110</td>
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<td>NeLMA</td>
<td>Northeastern Lumber Manufacturers' Association</td>
<td>(207) 829-6901</td>
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<td>National Electrical Manufacturers Association</td>
<td>(703) 841-3200</td>
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<td>NETA</td>
<td>InterNational Electrical Testing Association</td>
<td>(888) 300-6382 (269) 488-6382</td>
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<td>NFPA</td>
<td>NFPA (National Fire Protection Association)</td>
<td>(800) 344-3555 (617) 770-3000</td>
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<td>NFRC</td>
<td>National Fenestration Rating Council</td>
<td>(301) 589-1776</td>
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<td>NHLA</td>
<td>National Hardwood Lumber Association</td>
<td>(800) 933-0318 (901) 377-1818</td>
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<td>NLGA</td>
<td>National Lumber Grades Authority</td>
<td>(604) 524-2393</td>
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<td>NRCA</td>
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<td>(800) 323-9545 (847) 299-9070</td>
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<td>NRMCA</td>
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<td><a href="http://www.nrmca.org">www.nrmca.org</a></td>
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<tr>
<td>NSF</td>
<td>NSF International (National Sanitation Foundation International)</td>
<td><a href="http://www.nsf.org">www.nsf.org</a></td>
<td>(800) 673-6275</td>
</tr>
<tr>
<td>NWDDA</td>
<td>National Wood Window and Door Association (Now WDMA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDI</td>
<td>Plumbing &amp; Drainage Institute</td>
<td><a href="http://www.pdionline.org">www.pdionline.org</a></td>
<td>(800) 589-8956</td>
</tr>
<tr>
<td>PGI</td>
<td>PVC Geomembrane Institute</td>
<td><a href="http://pgi-tp.ce.uiuc.edu">http://pgi-tp.ce.uiuc.edu</a></td>
<td>(217) 333-3929</td>
</tr>
<tr>
<td>RCSC</td>
<td>Research Council on Structural Connections</td>
<td><a href="http://www.boltcouncil.org">www.boltcouncil.org</a></td>
<td></td>
</tr>
<tr>
<td>RFCI</td>
<td>Resilient Floor Covering Institute</td>
<td><a href="http://www.rfci.com">www.rfci.com</a></td>
<td>(301) 340-8580</td>
</tr>
<tr>
<td>RIS</td>
<td>Redwood Inspection Service</td>
<td><a href="http://www.redwoodinspection.com">www.redwoodinspection.com</a></td>
<td>(888) 225-7399</td>
</tr>
<tr>
<td>SDI</td>
<td>Steel Door Institute</td>
<td><a href="http://www.steeldoor.org">www.steeldoor.org</a></td>
<td>(440) 899-0010</td>
</tr>
<tr>
<td>SEI/ASCE</td>
<td>Structural Engineering Institute/American Society of Civil Engineers (See ASCE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIGMA</td>
<td>Sealed Insulating Glass Manufacturers Association (Now IGMA)</td>
<td></td>
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</tr>
<tr>
<td>SMA</td>
<td>Screen Manufacturers Association</td>
<td><a href="http://www.smacentral.org">www.smacentral.org</a></td>
<td>(561) 533-0991</td>
</tr>
<tr>
<td>SMACNA</td>
<td>Sheet Metal and Air Conditioning Contractors' National Association</td>
<td><a href="http://www.smacna.org">www.smacna.org</a></td>
<td>(703) 803-2980</td>
</tr>
<tr>
<td>SPIB</td>
<td>Southern Pine Inspection Bureau (The)</td>
<td><a href="http://www.spib.org">www.spib.org</a></td>
<td>(850) 434-2611</td>
</tr>
<tr>
<td>SSINA</td>
<td>Specialty Steel Industry of North America</td>
<td><a href="http://www.ssina.com">www.ssina.com</a></td>
<td>(800) 982-0355</td>
</tr>
<tr>
<td>SSPC</td>
<td>SSPC: The Society for Protective Coatings</td>
<td><a href="http://www.sspc.org">www.sspc.org</a></td>
<td>(877) 281-7772</td>
</tr>
<tr>
<td>Code</td>
<td>Full Name</td>
<td>Phone</td>
<td>Website</td>
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<tr>
<td>STI</td>
<td>Steel Tank Institute</td>
<td>(847) 438-8265</td>
<td><a href="http://www.steeltank.com">www.steeltank.com</a></td>
</tr>
<tr>
<td>TCA</td>
<td>Tile Council of America, Inc. (Now TCNA)</td>
<td>(703) 907-7700</td>
<td></td>
</tr>
<tr>
<td>TIA/EIA</td>
<td>Telecommunications Industry Association/</td>
<td>(703) 907-7700</td>
<td><a href="http://www.tiaonline.org">www.tiaonline.org</a></td>
</tr>
<tr>
<td></td>
<td>Electronic Industries Alliance</td>
<td></td>
<td></td>
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<tr>
<td>TMS</td>
<td>The Masonry Society</td>
<td>(303) 939-9700</td>
<td><a href="http://www.masonrysociety.org">www.masonrysociety.org</a></td>
</tr>
<tr>
<td>TPI</td>
<td>Truss Plate Institute, Inc.</td>
<td>(703) 683-1010</td>
<td><a href="http://www.tpinst.org">www.tpinst.org</a></td>
</tr>
<tr>
<td>UL</td>
<td>Underwriters Laboratories Inc.</td>
<td>(877) 854-3577</td>
<td><a href="http://www.ul.com">www.ul.com</a></td>
</tr>
<tr>
<td>UNI</td>
<td>Uni-Bell PVC Pipe Association</td>
<td>(972) 243-3902</td>
<td><a href="http://www.uni-bell.org">www.uni-bell.org</a></td>
</tr>
<tr>
<td>USGBC</td>
<td>U.S. Green Building Council</td>
<td>(800) 795-1747</td>
<td><a href="http://www.usgbc.org">www.usgbc.org</a></td>
</tr>
<tr>
<td>WCLIB</td>
<td>West Coast Lumber Inspection Bureau</td>
<td>(800) 283-1486</td>
<td><a href="http://www.wclib.org">www.wclib.org</a></td>
</tr>
<tr>
<td>WCMA</td>
<td>Window Covering Manufacturers Association</td>
<td>(212) 297-2122</td>
<td><a href="http://www.wcmanet.org">www.wcmanet.org</a></td>
</tr>
<tr>
<td>WDMA</td>
<td>Window &amp; Door Manufacturers Association</td>
<td>(800) 223-2301</td>
<td><a href="http://www.wdma.com">www.wdma.com</a></td>
</tr>
<tr>
<td></td>
<td>(Formerly: NWWDA - National Wood Window and</td>
<td>(847) 299-5200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Door Association)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWPA</td>
<td>Western Wood Products Association</td>
<td>(503) 224-3930</td>
<td><a href="http://www.wwpa.org">www.wwpa.org</a></td>
</tr>
</tbody>
</table>

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

<table>
<thead>
<tr>
<th>Code</th>
<th>Full Name</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAPMO</td>
<td>International Association of Plumbing and</td>
<td>(909) 472-4100</td>
<td><a href="http://www.iapmo.org">www.iapmo.org</a></td>
</tr>
<tr>
<td></td>
<td>Mechanical Officials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICC</td>
<td>International Code Council</td>
<td>(888) 422-7233</td>
<td><a href="http://www.iccsafe.org">www.iccsafe.org</a></td>
</tr>
</tbody>
</table>
C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Name</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>Army Corps of Engineers</td>
<td>(202) 761-0011</td>
<td><a href="http://www.usace.army.mil">www.usace.army.mil</a></td>
</tr>
<tr>
<td>DOC</td>
<td>Department of Commerce</td>
<td>(202) 482-2000</td>
<td><a href="http://www.commerce.gov">www.commerce.gov</a></td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Energy</td>
<td>(202) 586-9220</td>
<td><a href="http://www.energy.gov">www.energy.gov</a></td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
<td>(202) 272-0167</td>
<td><a href="http://www.epa.gov">www.epa.gov</a></td>
</tr>
<tr>
<td>FDA</td>
<td>Food and Drug Administration</td>
<td>(888) 463-6332</td>
<td><a href="http://www.fda.gov">www.fda.gov</a></td>
</tr>
<tr>
<td>GSA</td>
<td>General Services Administration</td>
<td>(800) 488-3111</td>
<td><a href="http://www.gsa.gov">www.gsa.gov</a></td>
</tr>
<tr>
<td>LBL</td>
<td>Lawrence Berkeley National Laboratory</td>
<td>(510) 486-4000</td>
<td><a href="http://www.lbl.gov">www.lbl.gov</a></td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
<td>(301) 975-6478</td>
<td><a href="http://www.nist.gov">www.nist.gov</a></td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
<td>(800) 321-6742</td>
<td><a href="http://www.osha.gov">www.osha.gov</a></td>
</tr>
<tr>
<td>SD</td>
<td>State Department</td>
<td>(202) 647-4000</td>
<td><a href="http://www.state.gov">www.state.gov</a></td>
</tr>
<tr>
<td>USDA</td>
<td>Department of Agriculture</td>
<td>(202) 720-2791</td>
<td><a href="http://www.usda.gov">www.usda.gov</a></td>
</tr>
</tbody>
</table>

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
REFERENCES

ADAAG  Americans with Disabilities Act (ADA)
Architectural Barriers Act (ABA)
Accessibility Guidelines for Buildings and Facilities
Available from U.S. Access Board
www.access-board.gov

(800) 872-2253
(202) 272-0080

CFR  Code of Federal Regulations
Available from Government Printing Office
www.gpoaccess.gov/cfr/index.html

(866) 512-1800
(202) 512-1800

FED-STD  Federal Standard
(See FS)

FS  Federal Specification
Available from Department of Defense Single Stock Point
http://dodssp.daps.dla.mil

Available from Defense Standardization Program
www.dps.dla.mil

Available from General Services Administration
www.gsa.gov

Available from National Institute of Building Sciences
www.wbdg.org/ccb

(215) 697-2664
(202) 619-8925
(202) 289-7800

FTMS  Federal Test Method Standard
(See FS)

MIL  (See MILSPEC)

MIL-STD  (See MILSPEC)

MILSPEC  Military Specification and Standards
Available from Department of Defense Single Stock Point
http://dodssp.daps.dla.mil

(215) 697-2664

UFAS  Uniform Federal Accessibility Standards
Available from Access Board
www.access-board.gov

(800) 872-2253
(202) 272-0080

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200
SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary support, security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary of Work" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading, if required. Unit must be large enough for regular job meetings, plan review areas, submittal storage and other job file and administrative functions.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Sheds to be metal box storage units or have wood floors raised above the ground.
   2. Store combustible materials apart from building.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
E. Telephone Service: The Contractor shall maintain at his expense a job telephone, not a "Pay Telephone". The job telephone shall be available to the Architect, the Owner's staff, Municipal Officials or Inspectors and all subcontractors. All calls shall be paid for by the Contractor.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Provide temporary parking areas for construction personnel.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
   a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touch up signs so they are legible at all times.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000
SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Sections:

1. Section 012500 "Substitution Procedures" for requests for substitutions.
2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one (1) week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within seven (7) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
   a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
   b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.


1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two (2) or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
   1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
PRODUCT REQUIREMENTS

6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

3. Products:

   a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one (1) of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.

   b. Non-Restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one (1) of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. Manufacturers:

   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one (1) of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.

   b. Non-Restricted List: Where Specifications include a list of available manufacturers, provide a product by one (1) of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one (1) of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one (1) of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed, SIDE-BY-SIDE comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

B. Related Sections:

1. Section 013300 "Submittal Procedures" for submitting surveys.
2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor licensed in the State of Connecticut.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching.

E. Existing Utility Services: Where existing services are required to be removed, relocated, or abandoned, bypass such systems before cutting to minimize interruption to occupied areas.

F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

5. Proceed with patching after construction operations requiring cutting are complete.

G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

   b. Restore damaged pipe covering to its original condition.

3. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
2. Do not hold waste materials more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   a. Utilize containers intended for holding waste materials of type to be stored.
4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300
SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.

B. Related Sections:

1. Section 017300 "Execution" for progress cleaning of Project site.
2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.
5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.


10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools and similar elements.

11. Advise Owner of changeover in heat and other utilities.

12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

13. Complete final cleaning requirements, including touchup painting.

14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."

2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Submit pest-control final inspection report and warranty.

5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

6. Secure and provide both temporary and final Certificate of Occupancy from the Building Official, meeting all local and state permit closeout requirements.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or comparable form.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

4. Submit list of incomplete items in the following format:

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION (Not Used)

END OF SECTION 017700
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

B. Related Sections:
   1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
   2. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS
A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS
A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

   1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

   1. Three (3) paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two (2) copies.
C. Initial Manual Submittal: Submit draft copy of each manual at least thirty (30) days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or modify each manual to comply with Architect's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
8. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
   1. If operation or maintenance documentation requires more than one (1) volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one (1) system into a single binder.

E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
   1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8½-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
      a. If two (2) or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
      b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
   2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
   3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
   5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
      a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
      b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire.
   2. Flood.
   5. Power failure.
   7. System, subsystem, or equipment failure.
   8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
   5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   2. Performance and design criteria if Contractor is delegated design responsibility.
   3. Operating standards.
   4. Operating procedures.
   5. Operating logs.
   6. Wiring diagrams.
   7. Control diagrams.
   8. Piped system diagrams.
   9. Precautions against improper use.
   10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
   1. Startup procedures.
   2. Equipment or system break-in procedures.
   3. Routine and normal operating instructions.
   4. Regulation and control procedures.
   5. Instructions on stopping.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one (1) item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and
flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

B. Related Sections:
   1. Section 017700 "Closeout Procedures" for general closeout procedures.
   2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
   3. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit one (1) set(s) of marked-up record prints.

B. Record Specifications: Submit one (1) paper copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one (1) paper copy of each submittal.
   1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one (1) set of marked-up paper copies of the Contract Drawings and Shop Drawings.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
   
a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an acceptable drawing technique.
   c. Record data as soon as possible after obtaining it.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:
   
a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Locations and depths of underground utilities.
   d. Revisions to routing of piping and conduits.
   e. Revisions to electrical circuitry.
   f. Actual equipment locations.
   g. Duct size and routing.
   h. Locations of concealed internal utilities.
   i. Changes made by Change Order or Construction Change Directive.
   j. Changes made following Architect's written orders.
   k. Details not on the original Contract Drawings.
   l. Field records for variable and concealed conditions.
   m. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
3. Identification: As follows:
   
a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as paper copy.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as paper copy.

1. Include record Product Data directory organized by specification section number and title, electronically linked to each item of record Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one (1) copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.
END OF SECTION 017839
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.

B. Related Sections:

1. Divisions 02 through 49 Sections for specific requirements for demonstration and training for products in those Sections.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules utilizing manufacturer-produced demonstration for systems, equipment, and products in lieu of video recording of live instructional module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:
   a. Emergency manuals.
b. Operations manuals.
c. Maintenance manuals.
d. Project record documents.
e. Identification systems.
f. Warranties and bonds.
g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.

7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

   1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
   2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

   1. Schedule training with Owner with at least seven (7) days advance notice.

D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test and ask Owner to sign-off on for acceptance.

E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900
PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract including General and Supplementary Conditions, and General Requirements apply to the work specified in this Section.

1.2 SECTION INCLUDES

A. Work Included: Providing all Site Preparation as shown on the Drawings, and as specified, including, but not necessarily limited to the following:

1. Review of existing conditions and subsurface data.
2. Provide and install safety barriers, construction fencing and temporary signage as necessary and as directed by the Owner and Engineer.

1.3 EXISTING CONDITIONS - It shall be the obligation of each bidder to satisfy himself by examination of the site that the existing conditions, existing elevation grades, and existing improvements shown are accurate. No claim for extra compensation for inaccuracies of existing conditions will be allowed.

1.4 ADDITIONAL INFORMATION - Upon award of contract, the Contractor may make their own subsurface and site investigations to substantiate existing subsurface soil conditions.

1.5 JOB CONDITIONS

A. Contact Call-Before-You-Dig services for Connecticut (1.800.922.4455) to locate underground utilities prior to commencing site preparation operations.

B. The Contractor shall perform all work necessary to provide for maintenance and protection of vehicular traffic and pedestrian through traffic along sidewalks during the entire construction period. The Contractor shall coordinate work with the Engineer and the Owner in this regard.

C. No areas under construction shall be left accessible to pedestrians at any time. The Contractor shall take all necessary steps, as requested or approved by the Engineer, to secure the site. When making water, sewer drainage or any other utility connections, the Contractor is responsible for securing work areas that occur outside of the proposed construction fence line for the entire time construction is taking place.

D. For construction access to the site, the Contractor shall use entrances as approved by the Owner for access and egress to the site. All damage to pavement, grounds and trees...
to remain caused by vehicular access to the site shall be repaired at the Contractor's expense to the satisfaction of the Engineer and the Owner.

E. The Contractor is responsible for protecting survey monuments, benchmarks and property boundary pins within the contract limits shown. The Contractor shall locate, maintain, raise, lower, or remove and replace to suit the new field conditions or if damaged by Contractor's operations.

F. Peripheral areas outside of the limit of work line shall not be disturbed or used for storing or stockpiling materials without the prior written approval of the Owner.

G. Stockpile Areas shall be as shown on the Plans and as approved by the Engineer prior to placement of material stockpiles. Stockpiles shall be maintained in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

A. All safety signs and barricades shall conform to standards specified in the “Manual on Uniform Traffic Control Devices” unless otherwise noted.

2.2 CONSTRUCTION FENCE

A. Chain-Link Fencing: Minimum two (2) inch, 0.148 inch thick, galvanized steel, chain-link fabric fencing; minimum six (6) feet high with galvanized steel pipe posts; minimum 2-3/8 inch OD line posts and 2-7/8 inch OD corner and pull posts, with 1-5/8 inch OD top rails.

B. Posts may be pedestal or post mounted as required by field conditions or as ordered by the Engineer.

PART 3 EXECUTION

3.1 CONSTRUCTION FENCE

A. Review all limits of construction fencing and barriers with the Engineer and Owner prior to installation. No work shall commence until all construction fencing is in place. Fencing shall be provided and maintained as necessary and as directed by the Engineer throughout the duration of the Contract.

B. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.

C. Remove fencing upon completion of the Contract, or as directed.
D. Additional Barricades, Warning Signs, and Lights: Comply with State of CT DOT standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch thick exterior plywood.
3.2 PROTECTION AND MAINTENANCE OF TRAFFIC

A. Supply, install, relocate and maintain signs and other approved devices for warning, controlling, routing, directing and detouring traffic as directed by the Engineer and in accordance with the “Manual on Uniform Traffic Control Devices.”

B. Provide access for emergency vehicles at all times.

3.3 DEMOLITION REQUIREMENTS

A. Conduct demolition operations in a manner that will prevent damage to adjacent structures, utilities, pavements and other facilities to remain.

B. Cease operations immediately if any damage, settlement or other adverse effect on adjacent structures occurs. Immediately notify the Owner and regulatory authorities. Do not resume operations until conditions are corrected, damage repaired and approval has been received from the Owner.

3.4 FILLING VOIDS

A. Completely fill excavation areas and voids resulting from demolition or removal of structures including utilities, underground fuel storage tanks, wells and cisterns with suitable material.

B. Areas to be filled shall be free of standing water, frost, frozen, and unsuitable material prior to fill placement.

C. Place and compact fill materials in conformance with the requirements of Section 312000. Fill shall be placed in horizontal layers not exceeding 8-inches in loose depth.

D. Grade filled area surface to match adjacent grades and slope to provide surface drainage.

3.5 REMOVAL AND ABANDONMENT OF UTILITIES

A. All existing structures, utilities, and appurtenances of any kind shall be completely removed within the limits of excavation for the new building.

B. Outside the limits of excavation for the new building, all abandoned utilities and utility structures greater than 8 inches in diameter located at least 4 feet below bottom of finished grade shall be sealed with concrete slurry or brick masonry at the limit of excavation. All utilities shall be entirely removed, if they are within 4 feet of finished grade.
C. Manholes and catch basins designated to be abandoned shall have all lines plugged with brick and mortar prior to filling with sand or gravel. The top 4 feet of these structures shall be removed and the bottom slab broken up prior to filling.

D. The Contractor shall remove frames, covers, and grates from manholes, catch basins and gate valves and satisfactorily store and protect them until they are required for reuse in the work. Existing frames, covers and grates judged to be unsuitable for reuse shall be removed from the site and disposed of by the Contractor.

3.6 DISPOSAL OF DEBRIS

A. Remove from the site all materials resulting from demolition operations and all debris resulting from clearing and grubbing operations.

B. No burning of any material will be allowed.

C. Confirm with Engineer items that are to be salvaged. All demolished, excavated and removed materials not scheduled to be salvaged by the Owner for re-use on site or for future projects shall be removed and disposed of off-site legally and promptly.

D. All waste material shall be disposed of legally off site.

END OF SECTION 022200
SECTION 024116 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Demolition and removal of buildings.
   2. Removing below-grade construction.
   3. Disconnecting, capping or sealing, and removing site utilities.
   4. Salvaging items for reuse by Owner.

B. Related Sections:
   1. Section 013200 "Construction Progress Documentation" for preconstruction photographs taken before building demolition.
   2. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade site improvements not part of building demolition.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

   1. Inspect and discuss condition of construction to be demolished.
   2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.


C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

D. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services.
3. Shutoff and capping of utility services.

E. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.9 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.

B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
   a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: Present in buildings and structures to be demolished. A report on the presence of hazardous materials is included for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. On-site storage or sale of removed items or materials is not permitted.

1.10 COORDINATION

A. Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
C. Perform an engineering survey of condition of building to determine whether removing any element might result in unplanned collapse of any portion of structure during building demolition operations.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

B. Salvaged Items: Comply with the following:
   1. Clean salvaged items of dirt and demolition debris.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to storage area designated by Owner.
   5. Protect items from damage during transport and storage.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
   1. Owner will arrange to shut off utilities when requested by Contractor.
   2. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
   3. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
   4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of demolition.
C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
   1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
      a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."
   1. Protect adjacent buildings and facilities from damage due to demolition activities.
   2. Protect existing site improvements, appurtenances, and landscaping to remain.
   3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
   4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
   6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

A. General: Demolish indicated buildings completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
   2. Maintain adequate ventilation when using cutting torches.
   3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
   2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage
adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
   1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Salvage: Items to be removed and salvaged are indicated on Drawings.

D. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
   1. Remove below-grade construction, including basements, foundation walls, and footings, completely.

E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures. Abandon and cap utilities outside of this area.

3.7 SITE RESTORATION

A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 312000 "Earth Moving."
   1. Rough grade below-grade areas ready at areas for new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
B. Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 024116
SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
   3. Salvage of existing items to be reused or recycled.

B. Related Requirements:
   1. Section 011000 "Summary of Work" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
   2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Remove and Replace: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled. Provide and install new items as specified.

E. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged and reinstalled.

F. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.
B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstone
and their contents, commemorative plaques and tablets, and other items of interest or value to
Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials,
demolition personnel, equipment, and facilities needed to make progress and avoid
delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed
by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS


B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures
proposed for protecting individuals and property, for environmental protection, for dust control
and for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending
dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Coordination of Owner's continuing occupancy of portions of existing building and of
Owner's partial occupancy of completed Work.

D. Predemolition Photographs: Show existing conditions of adjoining construction, including
finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply
with Section 013233 "Photographic Documentation." Submit before Work begins.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility
licensed to accept hazardous wastes.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area.
Conduct selective demolition so Owner's operations will not be disrupted.
B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is included in the Contract Documents for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
4. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

   a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
   f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   5. Maintain adequate ventilation when using cutting torches.
   6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. All removed materials and rubbish shall be constantly sprinkled with water or other dusting agent to mitigate dust. Provide drop cloths or other type of coverings to prevent infiltration of dust to other parts of the existing building.
10. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to Owner's storage area on-site or off-site as designated by Owner.
   5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
SELECTIVE DEMOLITION

END OF SECTION 024119
PART 1 - GENERAL

1.1  SUMMARY

A. Provide selective demolition to remove existing carpeting/multiple layers of flooring/wood/concrete and demolish ceilings/walls/floors/doors/millwork/shelving/countertops/window systems/door systems/concrete/boilers/chases/mechanical systems/ductwork/roofing/masonry/stone/brick/wall and ceiling systems/raised flooring/wall materials (bulletin/chalk/white/etc. boards, mirrors), non-moveable objects, etc. as necessary to access all asbestos/PCB/other hazardous containing materials as specified herein, and as required for complete and proper interior abatement.

B. Please note there are several layers of flooring, ceilings, walls, chases, non-moveable objects requiring demolition to access all asbestos containing materials, some of which are contaminated with asbestos/PCBs and require disposal as such.

C. Required permits shall be obtained by the Contractor at no additional cost to the Owner.

D. Notes: Contractor is responsible for removing all asbestos/PCB containing materials (behind walls, ceilings, windows, chases, doors, windows, concrete, non-moveable objects, etc.) in demolition areas as noted by the architect's specifications and drawings.

E. The contractor will be required to remove carpeting and other flooring, wall and ceiling structures, raised flooring, multiple layers of mixed flooring to gain access to the asbestos flooring and/or mastic and carpet adhesives in all areas. There are more than one layer of flooring in most locations. All layers of floor tile, leveling materials, mastic, concrete, wood, thinset, sheet flooring, carpet adhesives, etc. are included in the base work, no extra change will be accepted. Demolition or moving typical non-movable objects by the abatement contractor is required to gain access to all flooring materials to be removed. SD sheets for chemicals to be used during the project must be submitted to the owners' representative prior to site delivery.

F. The contractor will be required to remove roofing, window and door systems, mechanical systems, flooring, walls, ceilings, wall applications/masonry, millwork, shelving and cabinetry to access all asbestos/PCB containing materials for abatement/remediation and packaging for recycling/removal/abatement and disposal.

G. Related Sections:

1. Section 028213 – Asbestos Abatement
2. Section 028313 – Lead-Based Paint Awareness
3. Section 028416 – Universal Waste Removal and Recycling
4. Section 028433 – PCBs Less than 50 PPM Remediation
5. HBM – 01 – Hazardous Building Materials Abatement Drawing
1.2 PROJECT CONDITIONS

A. Occupancy:
   1. Areas of the buildings in which demolition will occur will be unoccupied during work.

B. Existing Conditions:
   1. After the project is begun, the Contractor is responsible for the condition of the structures to be selectively demolished.
   2. Unforeseen Conditions: Should unforeseen conditions be encountered that affect design or function of project, investigate and fully submit an accurate, detailed, written report to the office of the Consultant. While awaiting a response, reschedule operations if necessary to avoid delay of overall project.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and sealed.

B. Insofar as is practicable, arrange operations to reveal unknown or concealed conditions for examination and verification before removal or demolition.

C. Verify actual conditions to determine, in advance, whether removal or demolition of any element will result in structural deficiency, overloading, failure, or unplanned collapse.
   1. Demolish and remove connections to all electrical gas, and plumbing fixtures required to remove asbestos containing materials.

3.2 PREPARATION

A. Traffic: Do not obstruct walks or public ways without the written permission of governing authorities and of the Owner. Where routes are permitted to be closed, provide alternate routes if required.

B. Protection:
   1. Provide for the protection of persons passing around or through the area of demolition.
   2. Perform demolition so as to prevent damage to adjacent improvements and facilities to remain.
   3. Protect walls, floors, and other new or existing work from damage during demolition operations.

C. Damages: Without cost to the Owner and without delay, repair any damage caused to facilities to remain.
3.3 POLLUTION CONTROLS
A. Control as much as practicable the spread of dust and dirt.
B. Observe environmental regulations.
C. Do not allow water usage resulting in freezing or flooding.
D. Do not allow adjacent improvements to remain to become soiled by demolition operations.

3.4 DEMOLITION - GENERAL
A. Remove: Items indicated to be removed shall be removed by the Contractor.
B. Existing to Remain: Construction or items indicated to remain shall be protected against damage during demolition operations. Where practical, and with the Owner's permission, the Contractor may elect to remove items to a suitable storage location during demolition and then properly clean and reinstall the items.
C. Perform work in a systematic manner.
D. Demolish and remove existing construction only to the extent required, as indicated in the Contract Documents.
E. Perform selective demolition using methods that are least likely to damage work to remain and which will provide proper surfaces for patching.
F. Remove debris daily.
G. Use any methods permitted by governing regulations and the requirements of the Contract Documents.

3.5 DISPOSAL OF DEMOLISHED MATERIALS
A. Promptly dispose of materials resulting from demolition operations. Non-contaminated material (materials not containing residue asbestos, lead, PCB or other hazardous, regulated or special waste) may be disposed of as construction waste. Do not allow materials to accumulate on site.
B. All rubbish and waste material from the Work shall be neatly stacked or kept in suitable containers and removed from the premises daily. The premises shall be kept clean and in an orderly condition at all times to the satisfaction of the Owner and the Consultant.
C. Transport materials resulting from demolition operations and legally dispose of off-site.
D. Off-site disposal location shall not be within one-half mile of any portion of the project site or within sight of the project site.
E. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
3.6 CLEANING

A. Throughout the construction period, the Contractor shall maintain the building and site free of rubbish, debris, surplus materials, and other items not required for the Work.

B. Remove such material from the site daily to prevent accumulations.

C. Remove all construction debris from work areas, and remove all hazardous waste and asbestos waste as required by the most current federal, state, and local regulations and the requirements of the specifications.

END OF SECTION 028200
SECTION 028213 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

B. Sections containing requirements related to this Section include, but are not limited to:
   1. Section 028200 – Selective Hazardous Building Materials Abatement Demolition
   2. Section 028313 – Lead-Based Paint Awareness
   3. Section 028416 – Universal Waste Removal and Recycling
   4. Section 028433 – PCBs Less than 50 PPM Remediation
   5. HBM – 01 – Hazardous Building Materials Abatement Drawing

1.2 CONSULTANT

A. The Owner shall retain Langan for the purposes of project management and monitoring during Asbestos Abatement. The Consultant will represent the Owner in all phases of the abatement project at the discretion of the Owner. The Asbestos Abatement Contractor will regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items. The State of Connecticut licensed Asbestos Consultant — Project Designer is Matthew Myers (license no. 000058).

1.3 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with the Contract Documents and with applicable Codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern.

C. It is not intended that the Specifications show every detail of the Work, but the Contractor shall be required to furnish within the Contract Sum all material and labor necessary for the completion of the Work in accordance with the intent of the Specifications.

D. In case of ambiguity among the Contract documents, the more stringent requirement as determined by the Consultant shall prevail.

E. The Work of this Contract includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.
F. All items, not specifically mentioned in the Specifications but implied by trade practices to complete the work, shall be included.

G. This specification and drawings cover the proper and legal removal and disposal of all asbestos-containing materials (ACM) and asbestos contaminated waste from the H. Smith Richardson Golf Course Clubhouse Facility project site located in Fairfield, Connecticut. The abatement activities shall comply with all aspects of the contract documents and Federal, State and local requirements.

H. Whenever there is a conflict or overlap within these specifications and between applicable codes and regulations, the most stringent provision specified shall apply.

1.4 EXAMINATION OF THE SITE

A. It is understood that the Contractor has examined the Site and made his own estimates of the facilities and difficulties attending the execution of the Work, and has based his price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the Contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.5 CONTRACTOR QUALIFICATIONS

A. All bidders shall submit a record of prior experience in asbestos abatement projects, listing no less than three (3) completed jobs in the past year, with all projects of similar size and scope. The Contractor shall list the experience and training of the project foremen and all on-site personnel. The information that should be included is as follows:

1. Project Name and Address
2. Owner's Name and Address
3. Architect/Consultant
4. Contract Amount
5. Date of Completion
6. Extras and Changes

B. The Contractor selected must appear on the approved list of Asbestos Abatement contractors on file at the State of Connecticut Department of Public Health (CT DPH) and hold a valid license for asbestos abatement within the State of Connecticut.

C. Submit a written statement regarding whether the Contractor has ever been found out-of-compliance with federal or state asbestos and/or lead regulations pertaining to worker protection, removal, transport, or disposal.

D. The Contractor shall be responsible for obtaining all necessary or required permits from the Federal, State and local agencies having jurisdiction over this asbestos abatement project. Failure on behalf of the Contractor to obtain these permits shall not result in any extension for the timely results of completion of the work set forth in the Contract. The Contractor shall be responsible and shall be required to pay any administrative penalties imposed on the owner for actions taken or lack thereof by the Contractor.

E. Work includes any and all selective demolition and protective measures required to access and remove ACM and maintain a safe working environment.
F. Upon completion of asbestos removal, the contractor shall provide completed, signed and notarized statements indicating that all asbestos-containing materials identified in the scope of work and project description (Section 1.08 and 1.09) were properly removed and disposed of in accordance with applicable Federal, State, and local regulations.

G. All contractors submitting a bid for this work shall visit the work site, attend a pre-bid meeting and walk-through, to be scheduled by the Owner, and be familiar with the work in its entirety. The contractors pre-meeting attendance and bid submission affirms his/her acceptance of the work, site, and building conditions as is.

H. The contractor shall be responsible for paying the utility bills for the use of power and water (unless owner agrees to supply at no cost to contractor). However, if any such temporary facilities cannot be provided, it shall be the contractor's responsibility to provide all temporary connections and hook-ups as well as obtaining permits and paying all fees for making such services available for his work as is necessary. If necessary, the Contractor shall provide temporary services as specified herein, and as required or as necessary to carry out the work. This may include such items as portable generators, water tank trucks, pumps and necessary accessories or the means and equipment and services necessary to temporarily connect to and maintain such services from adjacent utility systems. The use of portable generators will require 24 hour a day, 7 day a week continuous operation if negative air machines in containments are powered by them. This continuous operation must remain in place from the time the pre-abatement visual is completed up until clearance re-occupancy sampling results have passed. The contractor will pay the owner a $2,500 penalty should the power found to not be running the negative air machines in active abatement containments. This penalty will apply daily and the contractor is also responsible for paying all CT DPH fines that may be imposed on the contractor and owner. The contractor shall also comply with any local permits that may be required as well as local noise ordinances.

I. All Contractor personnel involved with asbestos removal work must be thoroughly familiar with the standard operating procedures of the Contractor for removal work as well as all applicable Federal and State regulations governing asbestos removal work.

J. The Supervisor and Asbestos Abatement workers shall be accredited in accordance with EPA regulation 40 CFR Part 763, subpart E, Appendix C; and CT DPH regulations as outlined in Section 19a-332a-1 through 19a-332a-16 (Standards for Asbestos Abatement), and Section 20-440-1 through 20-440-9 (Licensure and Training Requirements for Persons Engaged in Asbestos Abatement and Consulting Services).

K. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the work. Any discrepancies noted shall be brought to the attention of the Owner and Engineer prior to bidding the project. No claims for extras shall be made during construction/abatement/demolition.

L. Work includes necessary selective demolition and protective measures required to access and remove ACM and maintain a safe working environment. Asbestos containing materials that would be impacted by selective demolition of wall, ceiling and floor cavities shall be performed within negative pressure enclosure.

M. It is the sole responsibility of the Contractor to determine what, if any patents are applicable to the Project. The Contractor will pay all royalties and/or license fees, and will defend all suits or claims for infringement of any patent rights and save the Owner, Architect, Asbestos Safety
Control Monitor, Design Sub-Consultant, and Construction Manager harmless from loss, including attorney's fees, on account thereof.

N. The Contractor shall coordinate with the Consultant and maintain the project schedule.

O. The abatement contractor shall hold and document daily pre-abatement safety tool box meeting to review safe work practices and emergency communication program for the project. The abatement contractor's supervisor and the consultant's project monitor must also ensure that proper fire extinguishing equipment is present. The supervisor shall be knowledgeable in use of fire extinguishing equipment, and emergency exit plans.

1.6 TESTING LABORATORY SERVICES

A. The Contractor shall submit to the Consultant the name; address and qualifications of proposed laboratories intended to be utilized for sample analysis as required by this section and the laboratories must be approved by CT DPH.

1.7 ADDITIONAL GENERAL REQUIREMENTS

A. The Asbestos Abatement Contractor shall employ a competent Asbestos Abatement Supervisor with at least three (3) years’ experience on projects of similar scope and magnitude who shall be responsible for all work involving asbestos abatement as described in the specifications and defined in applicable regulations, and have full time daily supervision of the same. The Supervisor shall be the competent person as defined by OSHA regulations.

B. The Contractor shall allow the work of this contract to be inspected if required by local, state, federal, and any other authorities having jurisdiction over such work. The Contractor shall immediately notify the Owner and Consultant and shall maintain written evidence of such inspection for review by the Owner and Consultant.

C. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.

D. The Contractor shall immediately notify the Owner and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of who issued, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

1.8 SCOPE OF WORK

A. This specification and drawing HBM-01 cover the proper and legal removal and disposal of all asbestos-containing materials (ACM) and asbestos contaminated waste from the H. Smith Richardson Golf Course Clubhouse Facility Site project site located in Fairfield, Connecticut. The abatement activities shall comply with all aspects of the contract documents and Federal, State and local requirements. There is interior and exterior, friable and non-friable asbestos containing materials (miscellaneous materials) identified on the site. PCBs less than 50 ppm was found in interior/exterior source window caulking/sealant compounds throughout the main building (assume multiple layers of sealant, accessible and inaccessible). Universal wastes are located throughout the buildings.
1.9 PROJECT DESCRIPTION

A. The H. Smith Richardson Golf Course Clubhouse Facility was constructed in 1972. It is one story building and has an adjacent boiler room, golf cart barn, storage shed, marshal/superintendent booth structures and the approximate total square footage is 10,350 square feet.

B. The base bid includes the removal and disposal of all asbestos containing materials as identified herein, and on the architects drawings by workers meeting requirements of OSHA 1926.1101 for Class 1 and 2 work. The base bid will include the cost for removal and disposal of asbestos containing flooring materials, transite cement board, wall adhesives, window and door system caulking compounds, wall tar/paper/damp-proofing and roof flashing materials. The interior/exterior source window caulking/sealant compounds (windows) throughout the main building (assume multiple layers of sealant, accessible and inaccessible) contain PCBs > 50 ppm and will be removed and disposed of as mixed PCB and asbestos waste. Work includes filing and permitting all necessary applications, notifications, requirements and fees; insurance; necessary design services; providing skilled, licensed and certified labor; materials; and equipment necessary for proper preparation, handling, removal and legal disposal of all asbestos-containing materials and asbestos contaminated waste from the subject building in accordance with all requirements of applicable federal, state and local regulations, these specifications and the contract drawings. The following materials and amounts are included in the base bid work.

**Base Bid**

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<tr>
<th>Material</th>
<th>Location</th>
<th>Estimated Quantity of ACM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Tiles (various colors), Black Mastic and Brown/Black/Yellow Flooring Materials and Mastics (multiple layer of flooring materials/carpeting in many locations, under non-movable objects and sheetrock walls) (includes contaminated substrates) – Miscellaneous Materials</td>
<td>Pro Shop, Corridors, Grill Room, Women’s Locker Room and Entry, Office and Storage Rooms Adjacent Men’s Locker Room, Men’s Locker Room, Throughout</td>
<td>ALL - Approximately 5,750 Square Feet</td>
</tr>
<tr>
<td>Transite Cement Board (includes contaminated substrates) – Miscellaneous Material</td>
<td>Grill Room and Pro Shop (inside window wall panels – assume multiple layers)</td>
<td>ALL</td>
</tr>
<tr>
<td>Mirror/Wall Adhesives (includes contaminated substrates) – Miscellaneous Material</td>
<td>Men’s and Women’s Locker Rooms/Toilet Rooms, Throughout</td>
<td>Estimate 75 Square Feet (will be added or deducted using unit pricing)</td>
</tr>
</tbody>
</table>
C. The contractor will coordinate and perform enough demolition to access all materials to be removed/abated/remediated. Exterior abatement/remediation will be either removed in containment (interior) or the abatement/remediation contractor will install polyethylene sheeting/plywood on the interior of the building and remove materials from the exterior. All ground surfaces must be protected with plywood and two layers 10-mil reinforced polyethylene sheeting. This ground protection must extend at least 20 feet away from the building foundation. The contractor will pay for all contamination/remediation/abatement of interior and exterior surfaces, including ground surfaces if Langan deems they have contaminated these surfaces.

D. Additional materials as discovered outside of those listed will be covered by unit prices if all is not listed as the quantity. Quantities are estimates only and should be verified by the Contractor. Safety data sheets for chemicals to be used during the project must be submitted to the Owner's Representative prior to site delivery. The contractor is responsible for providing temporary water, power, and heat as needed at the site. Temporary lighting within the work areas must be connected to Ground Fault Circuit Interrupter (GFCI) Power Panels installed by a State of Connecticut licensed electrician and located outside of the work areas. The contractor shall be responsible for paying for the use of power and water. It shall also be the contractor's responsibility to provide all fixed and temporary connections and hook-ups as well as obtaining permits and paying all fees for making such services available for his work as is necessary. The Contractor shall provide services as specified herein, and as required or as necessary to carry out the work. This will include such items as temporary hard line installation, portable generators for short term work, water tank trucks, pumps and necessary accessories or the means and equipment and services necessary to temporarily connect to and maintain such services from adjacent utility systems. The contractor is responsible for contacting all utility services and getting power connections from the electrical lines located on or adjacent to the properties. All power and water must be supplied 24 hours a day throughout the abatement project. CT DPH will be notified immediately if active
containments do not have sufficient negative pressure throughout the abatement process until acceptable re-occupancy air results are received. The use of portable generators will require 24 hour a day, 7 day a week continuous operation if negative air machines in containments are powered by them. This continuous operation must remain in place from the time the pre-abatement visual is completed up until clearance re-occupancy sampling results have passed. The contractor will pay the owner a $2,500 penalty should the power found to not be running the negative air machines in active abatement containments. This penalty will apply daily and the contractor is also responsible for paying all CT DPH fines that may be imposed on the contractor and owner.

E. The general/abatement contractors shall only use heavy equipment operators that have proper asbestos and/or hazwoper training when disturbing/removing/moving and packing asbestos, lead-based paint and PCB containing materials. Acceptable training for asbestos can be 32 or 40 hour asbestos worker/supervisor with annual refresher training. 40 hour hazwoper training and annual refresher training is required for operators handling lead and/or PCB containing/contaminated materials. All operators must also have current medicals, fit test data and wear respirators during work.

F. The remediation/asbestos abatement contractor, their subcontractors, waste transporters and/or landfill(s) do not have permission to take/analyze building materials for PCB content/concentrations without written permission from the building owner prior to such sampling. Should the contractor or other parties listed above take/analyze PCB samples without the owner’s permission and PCB’s are found to be >1 ppm, the hazardous materials/remediation contractor will be responsible for all costs associated with the abatement/remediation/replacement of all the interior/exterior building materials and adjacent surfaces, including soil/asphalt/concrete/etc. as well as all costs associated with project delays, attorney fees for all parties affected and all costs resulting from CT DEEP/EPA requirements that may occur as a result.

G. The remediation/asbestos abatement contractor, their subcontractors, waste transporters must submit landfill information to Langan and the owner prior to the shipment of any waste. The contractor(s)/hauler(s) cannot ship waste until Langan and the owner have approved the landfill the contractor/hauler is/are proposing to ship the waste to. PCB TCLP sampling of the waste may be required by the landfills permits and this testing must be performed by the contractor (if testing is approved by Langan and the owner), with Langan present during sampling, and the results made available to Langan and the owner prior to waste shipment. If Langan is not present during the sampling, Langan may perform additional PCB TCLP sampling to confirm the contractor’s results and these results will supersede the contractors sample results.

H. The Owner shall retain a Consultant for the purposes of project management and monitoring during asbestos abatement. The Consultant will represent the Owner in all phases of the abatement project at the discretion of the Owner. The asbestos abatement contractor will regard the consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items. The State of Connecticut licensed Asbestos Consultant — Project Designer is Matthew Myers (license no. 000058).
1.10 DEFINITIONS

A. The following definitions relative to asbestos abatement apply:

1. **Abatement** - Procedures to control fiber release from asbestos-containing materials; includes removal, encapsulation, and enclosure.
2. **Air Monitoring** - The process of measuring the fiber concentration of an area or of a person.
3. **Amended Water** - Water to which a surfactant has been added.
4. **Asbestos** - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.
5. **Asbestos Felt** - A product made by saturating felted asbestos with asphalt or other suitable bindery, such as a synthetic elastomer.
6. **Asbestos Fibers** - Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
7. **Asbestos Work Area** - A regulated area as defined by OSHA 29 CFR 1926.1101 where asbestos abatement operations are performed which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
8. **Asphalt Shingles, Composition Shingles or Strip Slates: (Pitched Roof Shingle)** - A roofing material manufactured by saturating a dry felt with asphalt then coating the saturated felt with a harder asphalt mixed with a fine mineral, glass fiber, asbestos or organic stabilizer. All or part of the weather side may be covered with mineral granules, or with powdered talc or mica.
9. **Base Flashing** - the flashing provided by upturned edges of a water tight membrane on a roof. May contain metal and associated waterproofing material or combination of roofing felts and waterproofing at the joint between a roofing surface and a vertical surface such as a wall or parapet. Also base flashing may be present at perimeter of completely flat roof.
10. **Built-Up Roofing** - A continuous roof covering made up of laminations or plies of saturated or coated roofing felts, alternated with layers of asphalt or coal-tar pitch and surfaced with gravel, paint or finish coat.
11. **Caulking** - Resilient mastic compound often having a silicone bituminous or rubber base; used to seal cracks, fill joints, and prevent leakage. Typical applications: around windows, and doors. Caulking is at joints between two dissimilar materials. (i.e. masonry to wood, masonry to steel)
12. **Clean Room** - An uncontaminated area or room, which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
13. **Clearance Sampling** - Final air sampling performed aggressively after the completion of the abatement project in a regulated area. Air samples collected by the air sampling professional having a fiber concentration of less than 0.01 fibers/cc of air in each of five (5) samples collected inside the containment will denote acceptable clearance sampling by Phase Contrast Microscopy.
   or
   Five air samples collected inside the containment by the air sampling professional having an average asbestos concentration of less than 70 structures per square millimeter of air will denote acceptable clearance sampling for Transmission Electron Microscopy.
14. **Competent Person** - As defined by 29 CFR 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. Who has authority to take prompt corrective measures to eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with EPA's Model Accreditation Plan.

15. **Curtained Doorway** - A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of six feet apart can form an airlock.

16. **Damp Proofing** - application of a water impervious material to surface such as wall to prevent penetration of moisture, typically at foundation or below grade surface.

17. **Decontamination Enclosure System** - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.

18. **Encapsulant** - A liquid material which can be applied to asbestos-containing materials which controls the possible release of asbestos fibers from the materials either by creating a membrane over the surface (bridging encapsulant) or penetrating the material and binding its components together (penetrating encapsulant).

19. **Equipment Room** - Any contaminated area or a room that is part of the worker decontamination enclosure with provisions for storage of contaminated clothing and equipment.

20. **Fixed Object** - Unit of equipment or furniture in the work areas that cannot be removed from the work area.

21. **Friable Asbestos Materials** - Any material that contains more than 1% asbestos by weight, that can be crumbled, pulverized or reduced to powder by hand pressure.

22. **Glazing Compound** - any compound used to hold window glass in place, also referred to as putty, or glazier's putty, is not field applied, usually installed during manufacture of windows.


24. **Hepa Vacuum Equipment** - Vacuum equipment equipped with an I IEPA filter system for filtering the effluent air from the unit.

25. **Movable Object** - Unit of equipment of furniture in the work area that can be removed from the work area.

26. **Negative Air Pressure Equipment** - A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.

27. **NESHAPS** - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.

28. **Permissible Exposure Level (PEL)** - The maximum airborne concentration of asbestos fibers to which an employee is allowed to be exposed. The new level established by OSHA 29 CFR 1926.1101 is 0.1 fibers per cubic centimeter of air as an eight (8) hour time weighted average and 1.0 fibers /cc averaged over a sampling period of 30 minutes as an Excursion Limit. The Contractor is responsible for maintaining work areas in a manner that this standard is not exceeded.

29. **Project Monitor** - A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or an engineer with experience in asbestos air monitoring and worker protection equipment.
and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with 29 CFR 1910.1001 and 29 CFR 1926.1101.

30. **Regulated Area** - An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos exceed or there is a reasonable possibility that they may exceed the PEL.

31. **Shower Room** - A room between the clean room and the equipment room in the work decontamination enclosure with hot and cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.

32. **Waterproofing** - Material, usually a membrane or applied compound (tar/mastic), used to make a surface impervious to water, includes concealed conditions (applications around doors, windows, and in wall cavities). Sometimes combined with felts.

1.11 **SUBMITTALS**

A. **Pre-Work Submittals**: Within 7 days prior to the pre-construction conference, the Contractor shall submit 3 copies of the documents listed below to the Owner and Engineer for review:

1. Valid Contractor's Asbestos Removal license issued by the Connecticut Department of Public Health (CT DPH).
2. Certificate of insurance covering work of this Contract.
3. Name, experience of supervisors, and copies of valid Asbestos Supervisor permits issued by the CT DPH.
4. Citations/Violations/Legal Proceedings: Submit a statement describing:
   a. Any citations, violations, criminal charges, or legal proceedings undertaken or issued within the past two years by any law enforcement, regulatory agency, or consultant concerning performance on previous abatement contracts. Briefly describe the circumstances citing the Project and involved persons and agencies as well as the outcome of any actions.
   b. Any litigation or arbitration proceedings arising out of performance on past Projects.

5. Work Schedule:
   a. Show the complete sequence of abatement activities and the sequencing of work within each building section.
   b. Show the dates for the beginning and completion of each major element of work including substantial completion dates for each work area, building, or phase.
   c. Show projected percentage of completion for each item, as of the first day of each month.
   d. Show final inspection dates.

6. Project Notifications: As required by Federal, State, and local regulatory agencies together with proof of transmittal (i.e. certified mail return receipt). The contractor shall notify the Connecticut Department of Public Health and US EPA Region 1 at least ten (10) days prior to the start of asbestos abatement, as required by the Regulations of Connecticut State Agencies, Section 19a-332a-3 and EPA.

7. Abatement Work Plan: The Contractor shall design, prepare and submit to the Authority for review and approval, a detailed asbestos removal plan for the project in accordance with the applicable regulations and these specifications. The plan shall, at minimum, show
limits of containment and work areas, methods of removal, location of decontamination units, number and location of negative air units, waste routes, waste storage location, entrance and exits, emergency exits, and any necessary details. Work shall not commence until the Authority has reviewed, commented and approved the contractor's asbestos removal plan. Provide plans which clearly indicate the following:

a. All Work Areas/containment numbered sequentially.
b. Locations and types of all decontamination enclosures.
c. Entrances and exits to the Work Areas/containment.
d. Type of abatement activity/technique for each Work Area/containment.
e. Number and location of negative air units and exhaust. Also provide calculations for determining number of negative air pressure units.
f. Proposed location and construction of storage facilities and field office.
g. Location of water and electrical connections to building services.
h. Waste transport routes through the building to the waste storage container.

8. Contingency plan.
9. Name, location, and applicable licenses for primary and secondary landfill for disposal of asbestos-containing material and asbestos contaminated waste.
10. Summary of proposed materials, and equipment to be used.
11. Certification that vacuums, temporary ventilation equipment, and other equipment to be used meet the ANSI 29.2-79 requirement for airborne fiber filtration.
12. If rental equipment is to be used in work area or to transport asbestos contaminated waste, provide notice to rental agency stating intended use of equipment, with copy to the Authority.
13. Summary of the Contractor's workforce by disciplines. Include a notarized statement signed by the Contractor documenting that all proposed workers, by name, have received all required medical examinations and have been properly trained and certified in asbestos removal work, respirator use, to appropriate EPA and OSHA standards for asbestos removal. Include on statement Contractor's compliance with OSHA medical surveillance requirements.
14. The Contractor shall submit his/her Health and Safety Plan and Standard Operating Procedures for this project for use in complying with the requirements of these Specifications and applicable regulations. The Plan shall include, but shall not be limited to: distribution and use of amended water, the sequencing of asbestos work, detailed schedules and dates, shift times, and work activities during that shift, the interface of other trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the Site, security of the work areas, and a detailed description of the methods to be employed to control airborne fiber concentrations.
15. Written description of emergency procedures to be followed in case of injury or fire. This section must also include evacuation procedures, sources of medical assistance and procedures for access by medical personnel.
16. Level of respiratory protection intended for each operation for the project.

B. Project Closeout Submittals: Submit the following to Owner and Consultant at the close out of the Project (no later than 15 days subsequent to site demobilization):

1. Originals of all waste disposal manifests, seals, and disposal logs.
2. OSHA compliance air monitoring records conducted during the work.
3. Daily progress log.
a. A list of all workers used in the performance of the Project, including name, social security number, and CT DPH certification number.

b. For each worker used in the performance of the project, submit required employee statements including Medical Examination Statement, Worker's Acknowledgment Statement, Respirator Fit Test, and Employee Training Statement.

c. Certification for the laboratory that analyzed the OSHA personnel air samples.

d. A notarized “Release of Liens” in a form acceptable to the owner. Such notarized release of liens shall certify that all sub-contractors, labor suppliers, etc. have been paid their pro rate share of all payments to date for the project, that the contractor has no basis for further claims, and will not make further claims for payment in any account after the first payment is made to him.

1.12 MEDICAL REQUIREMENTS

A. Prior to potential exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1001, and 29 CFR 1926.1101.

1. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1910.1001, and 29 CFR 1926.1101 within the past year.

2. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos fibers and within thirty (30) calendar days before or after the termination of employment in such occupations.

B. As required by 29 CFR 1910.1001, and 29 CFR 1926.1101 maintain complete and accurate records of employees' medical examinations for a period of thirty (30) years after termination of employment and make records of the required medical examinations available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health, the Director of the National Institute for Occupational Safety and Health (NIOSH), authorized representatives of either of them, and an employee’s physician upon the request of the employee or former employee.


1.13 REGULATIONS AND STANDARDS

Regulatory compliance includes but is not necessarily limited to applicable requirements set forth by:

A. Federal Regulations:

1. 29 CFR 1910 and 1926 – Construction and General Industry Standards
2. 29 CFR 1910.1001, "Asbestos" (OSHA)
3. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
4. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
5. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
6. 29 CFR 1910.146, “Permit Required Confined Spaces” (OSHA)
7. 29 CFR 1926, "Construction Industry" (OSHA)
8. 29 CFR 1926.1101, "Asbestos, Tremolite, Anthophyllite, and Actinolite" (OSHA)
9. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
10. 40 CFR 61, Subpart A, "General Provisions" (EPA)
12. 40 CFR 763 Subpart E, “Asbestos in Schools Regulations” (EPA)
13. 49 CFR 171-172, Transportation Standards (DOT)

B. Connecticut Regulations:
State requirements which govern asbestos abatement work and hauling and disposal of asbestos waste materials include but are not necessarily limited to the following:

2. Connecticut Department of Public Health (CT DPH) regulations outlined in Section 19a-332a-1 through 19a-332a-16 “Standards for Asbestos Abatement”
3. CT DPH regulations outlined in Section 20-440-1 through 20-440-9 “Licensure and Training Requirements for Persons Engaged in Asbestos Abatement and Consulting Services”
4. Connecticut Department of Labor (CT DOL)
5. Connecticut Department of Transportation (CT DOT)

C. Local Regulations:
Local agencies which may govern or have certain requirements regarding asbestos abatement work or hauling and disposal of asbestos waste materials include but are not necessarily limited to the following:

1. Building Department
2. Health Department
3. Fire Department

D. Standards and Guidance Documents:

2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
3. EPA 560/585-024, Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book)
4. EPA 530-SW-85-007, Asbestos Waste Management Guidance

1.14 EXEMPTIONS

A. Any deviations from these specifications require the written approval and authorization from the Owner and Consultant.

B. Any modifications from the standard work practices identified in the CT DPH Standards for Asbestos Abatement, Sections 19a-332a-1 to 19a-332a-16 must be requested in writing, and approved in writing from the CT DPH.

1.15 FINAL AIR CLEARANCE

A. Following the completion of the encapsulation phase of the work, the Consultant shall collect final air clearance samples inside the work area per AHERA regulation 40 CFR Part 763 and
in compliance with CT DPH regulations. The Owner of the facility shall be responsible for payment of the sampling and analysis of the initial final air clearance samples only. The contractor shall be responsible for payment of all costs associated with the collection and analysis of additional final air clearance samples if the first set of samples fail to satisfy the clearance criteria.

1.16 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

A. The contractor shall make the following notifications, and provide the submittals to the following agencies prior to the commencement of removal work. This notification is required ten (10) calendar days prior to the start of the abatement project:

1. U.S. EPA, Region 1
   5 Post Office Square, Suite 100 (OES05-4)
   Boston, MA 02109-3912

2. Connecticut Department of Public Health
   410 Capital Avenue MS #12 AIR
   P.O. Box 340308
   Hartford, CT 06134

B. The minimum information included in the notification to these agencies includes:

   1. Name and address of building Owner/Operator
   2. Building location
   3. Building size, age, and use
   4. Amount of friable asbestos
   5. Work schedule, including proposed start and completion date
   6. Asbestos removal procedures to be used
   7. Name and location of disposal site for generated asbestos waste, residue, and debris
   8. If landfill opens in Connecticut to accept ACM waste, Consultant will notify CT DEEP prior to utilizing said landfill.

1.17 WORK SITE SAFETY PLAN

A. The contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the work site. The safety plan should include provisions for the following:

   1. Evacuation of injured workers.
   2. Emergency and fire exit routes from all work areas.
   3. Emergency first aid treatment
   4. Local telephone numbers for emergency services including ambulance, fire, and police.
   5. A method to notify occupants of the building in the event of a fire or other emergency requiring evacuation of the building.

B. The contractor is responsible for training all workers in these procedures.

1.18 INDEPENDENT AIR SAMPLING AND ASBESTOS ABATEMENT MONITORING
A. This section describes independent air sampling work being performed on behalf of the Owner. This work is not in the Contract Sum. This section describes air monitoring carried out by the Owner's Consultant to verify that the building beyond the work area and the outside environment remains uncontaminated. (Personal air monitoring required by OSHA is work to be performed by the Contractor and is within the Contract Sum.)

B. The purpose of the Owner's Consultant's air monitoring is to detect faults in the work area isolation such as:

1. Contamination of the building outside of the work area by airborne asbestos fibers.
2. Failure of filtration or rupture in the differential pressure system.
3. Contamination of air outside the building envelope by airborne asbestos fibers.
   Should any of the above occur the Contractor shall immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Owner's Consultant.

C. The Owner's Consultant will monitor airborne fiber counts in the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations, which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

D. To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to an acceptable level, the Consultant will sample and analyze air in accordance with clearance air sampling requirements.

E. The Owner's Consultant will perform on-site monitoring throughout the course of the project, as follows:

1. All work procedures shall be continuously monitored by the Consultant to assure that areas outside the designated work locations in the buildings will not be contaminated.
2. Prior to work on any given day, the Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination of the building or the employees. This includes a visual survey of the work area and the decontamination enclosure systems.

1.19 CONTRACTOR’S AIR SAMPLING RESPONSIBILITY

A. The contractor shall independently retain a CT licensed asbestos project monitor to monitor airborne asbestos concentrations in the workers' breathing zone and to establish conditions and work procedures for maintaining compliance with OSHA Regulations 29 CFR 1910.1001 and 1926.1101.

B. The Contractor's project monitor shall document all air sampling results and provide a report to the Consultant within 24 hours after sample collection.

D. A minimum of 20% of all workers in each working category (i.e., gross removal, final clearance, etc.) must be monitored each day of asbestos removal activities.

E. Phase Contrast Microscopy may be used to analyze personal air samples. The Contractor shall arrange and pay for all costs of the testing. Laboratories used shall be currently enrolled in the American Industrial Hygiene Association Proficiency Analytical Testing Program or an equivalent recognized program and approved by CT DPH.

1.20 PROPER WORKER PROTECTION

A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

B. All workers are to be accredited as abatement workers as required by the AHERA regulation 40 CFR 763 Appendix C to Subpart E, February 3, 1994.

C. The contractor is required to be certified and accredited as required by the State of Connecticut Department of Public Health Services.

D. In accordance with 29 CFR 1926 and 20-440-7 RCSA, all workers shall receive a training course covering the dangers inherent in handling asbestos, the dangers of breathing asbestos dust, proper work procedures, and proper worker protective measures. This course must include but is not limited to the following:

1. Methods of recognizing asbestos
2. Health effects associated with asbestos
3. Relationship between smoking and asbestos in producing lung cancer
4. Nature of operations that could result in exposure to asbestos
5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
   a. Engineering controls
   b. Work Practices
   c. Respirators
   d. Housekeeping procedures
   e. Hygiene facilities
   f. Protective clothing
   g. Decontamination procedures
   h. Emergency procedures
6. Waste disposal procedures
7. Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134
8. Appropriate work practices for the work
9. Requirements of medical surveillance program
10. Review of 29 CFR 1926
11. Pressure Differential Systems
12. Work practices including hands on or on-job training
13. Personal Decontamination procedures
14. Air monitoring, personal and area
E. The Contractor shall provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 f/cc or greater for an 8-hour Time Weighted Average and/or enter regulated areas. In the absence of specific airborne fiber data provide medical examinations for all workers who will enter the Work Area for any reason. Examination shall, at a minimum, meet OSHA requirements as set forth in 29 CFR 1926. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

F. Submit the following to the consultant for review. The contractor shall not start work until these submittals are returned with consultant action stamp indicating that they are approved.

1. Submit copies of certificates from an EPA-approved AHERA abatement workers course for each worker as evidence that each asbestos abatement worker is accredited as required by the AHERA Regulation 40 CFR 763 Appendix C to Subpart E, February 3, 1994.
2. Submit evidence that the contractor is certified to perform asbestos abatement work by the State of Connecticut Department of Public Health services.
3. Submit documents verifying that each worker has had a medical examination within the last 12 months as part of compliance with OSHA medical surveillance requirements. Submit, at a minimum, for each worker the following:
   a. Name and Social Security Number
   b. Physician's Written Opinion from examining physician including at a minimum the following:
      4. Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.
      5. Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
      6. Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
      7. Copy of information that was provided to physician in compliance with 29 CFR 1926
      8. Statement that worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat stress in the worker.
      9. Submit copies of certificates for the site supervisor and the workers issued by CT DPH.

G. Submit certification signed by an officer of the abatement-contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

H. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:

1. Non-essential personnel are prohibited from entering the area.
2. All authorized personnel entering the work area shall read the "Worker Protection Procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing.
3. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated.
4. Asbestos waste that is taken out of the work area must be properly bagged and labeled in accordance with these specifications. The surface of the bags shall be
decontaminated. Asbestos leaving the enclosure system must be immediately transported off-site or immediately placed in locked, posted temporary storage on-site, and removed within 24 hours of the project conclusion.

5. Any material, equipment, or supplies that are brought out of the decontamination enclosure system shall be cleaned and decontaminated by wet cleaning and/or HEPA vacuuming of all surfaces.

1.21 ALTERNATE WORK PRACTICES

A. The contractor and/or consultant may obtain services of a CT DPH certified asbestos project designer and submit application for variances to the CT DPH, as applicable for any alterations, modifications or non-conforming methods intended of asbestos removal. Methods requiring variances include but are not necessarily limited to glove-bagging, use of tent procedures, remote decons, etc. The alternative procedures shall be submitted in writing and hand delivered or post marked at least ten (10) days before the project start date. CT DPH may approve an alternative procedure for an asbestos abatement project with certain conditions that would provide equivalent or a greater measure of asbestos emission control than the conventional work practices. The alternate work practice request form shall be signed and sealed by a Licensed Designer. Any fees associated with the application shall be paid by the Contractor. All alternative work practices must be approved and accepted by Langan’s project designer regardless if they have been approved by CT DPH.

1.22 POST-PROJECT CLOSEOUT

A. The contractor shall provide all required documentation as required by this specification once his/her work is complete, final clearances passed and asbestos waste disposed of. This should include but not be limited to: bound copy of the daily log containing log of daily work activities, all supervisor and worker certificates of training and Connecticut licenses, certificates of insurance, daily sign in sheets, containment entry/exit logs, copy of recording manometer charts, waste shipment records, personal air monitoring laboratory reports and chain-of-custody documentation, and project completion certificate. Final payment shall not be made to the contractor until all required documentation is submitted and verified.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.

C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to the job site with factory label indicating 4 or 6 mil.

D. Polyethylene disposable bags shall be six (6) mil with pertinent pre-printed label. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.
E. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

F. Surfactant (wetting agent), shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one (1) ounce surfactant to five (5) gallons of water or as directed by manufacturer.

G. Removal encapsulant shall be non-flammable factory prepared penetrating chemical encapsulant found acceptable to Consultant. Usage shall be in accordance with manufacturer's printed technical data.

H. The contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with asbestos.

I. Impermeable containers are to be used to received and retain any asbestos-containing or contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with OSHA Standard 29 CFR 1926.1101. Containers must be both air and watertight.

J. Labels and signs, as required by OSHA Standard 29 CFR 1926.1101, will be used.

K. Encapsulant shall be bridging or penetrating type which has been found acceptable to the consultant. Usage shall be in accordance with manufacturer's printed technical data.

L. HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where asbestos-containing materials may be disturbed.

2.2 TOOLS AND EQUIPMENT

A. The contractor shall provide all tools and equipment necessary for asbestos removal, encapsulation and enclosure.

B. The contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements.

C. The contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape and air filters.

D. The contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and electrical power sources (such as generators). Any electrical connection work affecting the building electrical power system shall be performed by a State of Connecticut licensed electrician and the contractor shall obtain all necessary local permits.

E. The contractor shall have available shower stalls and plumbing to support same to include sufficient hose length and drain system or an acceptable alternate.
F. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of -0.02 inches of water within enclosure with respect to outside area. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four (4) air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside.

G. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.

H. The contractor will have reserve units so that systems will operate continuously.

2.3 RESPIRATORY PROTECTION

A. Select respirators from those approved by the Mine Safety and Health Administration (MSHA), and the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

B. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist on a yearly basis. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual. Fit-test records shall be maintained on-site for each employee.

C. Where fiber levels permit, and in compliance with regulatory requirements, Powered Air Purifying Respirators (PAPR) are the minimum allowable respiratory protection permitted to be utilized during gross removal operations. The Contractor shall use supplied air respirator for confined space requirements. PAPR’s are the minimal respiratory protection required for all thermal system insulation and surfacing asbestos abatement.

D. No respirators shall be issued to personnel without such personnel participating in a respirator training program.

E. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.1101.

F. A storage area for respirators shall be provided by the contractor in the clean room side of the personnel decontamination enclosure where they will be kept in a clean environment.

G. The contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult.

H. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.

I. Any authorized visitor, worker, or supervisor found in the work area not wearing the required respiratory protection shall be removed from the project site and not be permitted to return.
J. The contractor shall have at least two (2) Powered Air Purifying Respirators stored on-site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the contractor.


2.4 PROTECTIVE CLOTHING

A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may also be worn. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.

B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing abatement Work.

C. Eye protection and hard hats shall be provided and made available for all personnel entering any work area.

D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the work area.

PART 3 - EXECUTION

3.1 PRE-ABATEMENT MEETING

A. At least one week prior to the start of work a Pre-Construction Meeting will be scheduled and must be attended by the contractor and any sub-contractors. The assigned contractor site supervisor is also required to attend this meeting.

B. The contractor shall present a detailed project schedule and project submittals at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and consultant will inform the contractor of any scheduling adjustments for this project.

C. Following the Pre-Construction Meeting, the contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.2 WORK AREA PREPARATION

A. Where necessary, shut down electrical power, including receptacles and light fixtures. Under no circumstances during the decontamination procedures will lighting fixtures be permitted to be operating when the spraying of amended water may contact the fixture. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a State of Connecticut licensed electrician.

B. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within the work area shall be "criticalled" with duct tape and polyethylene sheeting.
C. The contractor shall be responsible for removing furniture from the work areas. The contractor shall pre-clean moveable objects within the proposed work areas using HEPA vacuum equipment and/or wet cleaning methods as appropriate and remove such objects from work areas to a temporary location. For example, cabinets to gain access to floor tile and associated mastic.

D. Seal off all openings, including, but not limited to, windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other penetration of the work areas, with polyethylene sheeting a minimum of six (6) mils thick, sealed with duct tape. This includes doorways and corridors that will not be used for passage during work areas and occupied areas.

E. Pre-clean fixed objects within the work areas, using HEPA vacuum equipment and/or wet cleaning methods as appropriate, and enclose with a minimum six (6) mil plastic sheeting sealed with duct tape.

F. Clean the proposed work areas using HEPA vacuum equipment or wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

G. After HEPA vacuum cleaning, cover fixed walls with two (2) layers of four (4) mil polyethylene sheeting to the floor level. Where fixed walls are not used, two layers of six (6) mil polyethylene sheeting will be applied to a rigid framework of wood, metal, or PVC. Where floor tile/mastic is not being abated, cover the floor with two (2) layers of six-mil polyethylene sheeting. All overlaps shall be sealed with tape or spray adhesive.

H. Maintain emergency and fire exits from the work areas, or establish alternate exits satisfactory to fire officials.

I. Clean and remove ceiling mounted objects, such as lights and other items not sealed off, which interfere with asbestos abatement. Use hand-held amended water spraying or HEPA vacuuming equipment during fixture removal to reduce settled fiber dispersal.

J. Create pressure differential between work areas and uncontaminated areas by the use of acceptable negative air pressure equipment sufficient to provide four (4) air changes per hour and create negative pressure of -0.02 inches of water within enclosure with respect to outside area as measured on a water gauge.

3.3 DECONTAMINATION SYSTEM

A. The following requirements shall be followed for the worker decontamination unit:

1. At all asbestos abatement projects, work areas shall be equipped with decontamination facilities consisting of: a clean room, a shower room, and an equipment room attached to each containment.

2. The decontamination enclosure system chambers shall be constructed to meet the criteria of the Specification. The decontamination enclosure shall be installed watertight to prevent water leaks. The interior shall be lined with two layers of 6-mil fire-retardant plastic sheeting, with a minimum overlap of 16 inches at seams and sealed (airtight) by tape and adhesive. The interior floor shall be sheathed with (2) layers of reinforced fire retardant plastic sheeting with a minimum overlap on the wall of sixteen (16) inches. The contractor shall ensure compliance with local building codes and other regulations governing temporary structures.
3. Curtained Doorways: Three overlapping sheets of 6-mil polyethylene shall be placed over a framed doorway and secured along the top of the doorway. Secure the vertical edge of the outer sheets along one vertical side of the doorway and the vertical edge of the center sheet along the opposite vertical side of the doorway. The sheets shall be weighted so that they close quickly after being released.

4. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
   
a. **Clean Room:** In this room, persons remove and leave all street clothes and put on clean disposable coveralls. Approved respiratory protection equipment is stored in this area. The floor of the clean room must be kept dry at all times. At the end of each shift, the room must be cleaned using wet rags. Also, a lockable door may be installed. No asbestos-containing materials are allowed in this room. The clean room shall be equipped with suitable hooks, lockers, shelves, etc. for workers to store personal articles and clothing. THIS IS NOT A CONTAMINATED AREA.

b. **Shower Room:** Provide a completely watertight operational shower to be used by clean dressed workers heading for the Work area from the clean room or for showering workers headed out of the Work Area after dressing in the Equipment Room. Shower must be constructed so that water leakage is minimized. The shower shall have one shower per six full shift abatement people, calculated on the basis of the largest shift. Any leaking water must be cleaned immediately. Showers must be equipped with hot and cold running water, soap and sufficient disposable towels for the number of workers at the job site. Arrange water shut off and drain pump operation controls, so that a single individual can shower without assistance from either inside or outside the work area. THIS IS A CONTAMINATED AREA.

   Pump wastewater into a polyethylene lined 55-gallon drum located in the work area to be added to the asbestos waste. If the water is allowed by the work treatment workers to be pumped into a drain, provide 20 micron and 5 micron waste water filters in line to drain. Change filters at a minimum of once a day. Locate filters inside the shower unit, so that the shower pan catches the water lost during filter change.

   c. **Equipment Room:** Work equipment, footwear, and all other contaminated work clothing are to be left here upon exiting work area. A walk-off pan filled with water shall be located in the work area just outside the equipment room for workers to clean foot coverings while exiting the work area. This is a change and transit area for workers. Provide a drop cloth layer of sheet plastic on the floor of the Equipment Room for every shift change. Roll drop cloth layer in upon itself at the end of each shift and dispose of as contaminated waste. THIS IS A CONTAMINATED AREA.

   Each room shall be separated from the other and from the work area by airlocks such as will prevent the free passage of air or asbestos fibers and shall be accessible through doorways protected with three (3) overlapping 6 mil polyethylene sheets which shall be weighed, so as to fall into place when people pass through the area. The shower room shall be contiguous to the clean room and equipment room. All personnel entering or leaving the work area shall pass through the shower room. The number of showers provided shall satisfy the requirements of OSHA 29 CFR 1910.141. Hot and cold water shall be supplied to the showers. The equipment room (dirty room) shall be situated between the shower room and the work area and separated from both by means of suitable barriers or overlapping flaps such as will prevent the free passage of air or asbestos fibers.

   Decontamination chamber doors shall be of sufficient height and width to enable replacement of equipment, which may fall, and to safely stretcher or carry an injured
worker from the site without destruction of the chamber or unnecessary risk to the integrity of the work area. Such doors must be at least four (4) feet wide, and the distance between sets of doors must be at least four (4) feet.

5. No person or equipment shall leave the asbestos abatement project work area unless first decontaminated by showering, wet washing or HEPA vacuuming to remove all asbestos debris. No asbestos contaminated materials or persons shall enter the clean room.

6. Where feasible, decontamination systems shall abut the work area. In situations where it is not possible, due to unusual conditions, to establish decontamination systems contiguous to the work area, personnel shall be directed to remove visible asbestos debris from their persons by HEPA-filtered vacuuming prior to donning clean disposable coveralls while still in the work area, and proceeding directly to a remote decontamination system to shower and change clothes to follow work area exit procedures.

7. In specific situations where the asbestos contractor determines that it is not feasible to establish a contiguous decontamination system at a work site, the asbestos contractor shall utilize a remote decontamination system if approved by Langan. Such systems must be operated in conformance with 29 CFR 1926.1101, Appendix F.

B. Remote Decontamination Facility:
For exterior work on the roof, glove bag or tent procedures, when full containment enclosure is not feasible, the Contractor shall provide remote personnel decontamination enclosure system if approved by the Consultant - Langan.

C. Occupied areas and/or building space not within the work areas shall be separated from asbestos abatement work areas by means of airtight barriers.

D. Construct the decontamination system with wood or metal framing, 3/8" sheathing and cover both sides with a double layer of six (6) mil polyethylene sheeting, spray glued or taped at the joints. Caulk joints watertight at floor, walls, and ceiling.

E. The contractor and the consultant shall visually inspect barrier several times daily to assure effective seal and the contractor shall repair defects immediately

F. Waste/Equipment Decontamination Enclosure System:
This system is located adjacent to the work area. The equipment decontamination enclosure system, consisting of two totally enclosed spaces, shall be constructed as follows:

1. Equipment Washroom: An equipment washroom shall have two air locks: one adjacent to the work area and one common air lock which separate it from the holding area. The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the work area, prior to moving to the washroom.

2. Holding Area: A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door shall be placed at the holding area entrance to prevent unauthorized access into the work area.

3. Remote Decontamination Facility: For exterior work on the roof, glove bag or tent procedures, when full containment enclosure is not required, the contractor shall provide remote Waste/Equipment decontamination enclosure system as specified.
3.4 ABATEMENT REMOVAL PROCEDURES

A. Regulatory compliance will include, but is not necessarily limited to, applicable requirements set forth by the Federal Environmental Protection Agency (EPA), Connecticut Departments of Public Health (CT DPH), Connecticut Department of Environmental Protection, and Hamden/local Health and Building Departments.

B. The following procedures shall be followed while performing the abatement activities:

1. No asbestos abatement work, including preparation, shall be performed or continued without having proper notification and a certified supervisor at the work area. The contractor shall have a designated "competent person" on the job at all times to ensure establishment of a proper enclosure system and proper work practices throughout the project.

2. Abatement work will not commence until authorized by the consultant.

3. Provide and display danger signs at every entrance to the work areas in clearly visible locations indicating that asbestos removal work is being conducted and unauthorized and not protected persons should not enter. Signs must use the following legend:

   DANGER
   ASBESTOS
   MAY CAUSE CANCER
   CAUSES DAMAGE TO LUNGS
   AUTHORIZED PERSONNEL ONLY
   WEAR RESPIRATORY PROTECTION AND
   PROTECTIVE CLOTHING IN THIS AREA

   Signs shall be posted which meet the specifications set forth in 29 CFR 1926.1101 at all approaches to the work area. Signs shall be posted a sufficient distance from the work area to permit a person to read the sign and take precautionary measures to avoid exposure to asbestos.

4. The worker decontamination enclosure system shall be installed or constructed prior to plasticizing the work area or before disturbing ACM. The waste decontamination enclosure system shall be installed or constructed prior to commencement of gross removal work.

5. All asbestos handlers shall wear disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment, after removing street clothes in the clean room.

6. Abatement of asbestos-containing materials shall be done by wet methods only.

7. ACM shall be sprayed with amended water in sufficient frequency and quantity for enhanced penetration. Sufficient time shall be allowed for penetration to occur prior to removal action or other disturbance-taking place. Dry removal of asbestos materials is prohibited.

8. In order to maintain indoor asbestos concentrations to the minimum, the wet asbestos must be removed in manageable sections. Material drop shall not exceed eight (8) feet. For heights up to 15 feet, provide inclined chutes or scaffolding to intercept drop.

9. Remove asbestos containing materials as appropriate by standard methods. Fill disposal containers as removal proceeds; seal filled containers and clean containers before removal to equipment decontamination system. Wet clean each container thoroughly, double bag and apply caution label. Ensure that workers do not exit the work area thorough the equipment decontamination enclosure.
10. After completion of stripping work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped, and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are not permitted). During this work, the surfaces being cleaned shall be kept wet.

11. Remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris. During cleanup, utilize brooms, rubber dustpan, and rubber squeegees to minimize damage to floor covering.

12. Retrieve all free water in contaminated areas and place in plastic lined leak-tight drums.

13. Sealed disposal containers, and all equipment used in the work area, shall be included in the cleanup and shall be removed from work areas via the equipment decontamination enclosure at an appropriate time in the cleaning sequence. All asbestos waste in 6-mil polyethylene disposal bags shall be double bagged in the equipment decontamination enclosure before removal from the Site.

14. At any time during asbestos removal, should the consultant suspect contamination of areas outside the work area(s), he shall cause all abatement work to stop until the contractor takes steps to decontaminate these areas and eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections certify decontamination.

15. After completion of the initial final cleaning procedure including removal of the inner layers of polyethylene sheeting, but prior to encapsulation, a pre-sealant inspection shall be conducted by the consultant. The pre-sealant inspection shall verify that ACM and residual dust has been removed from the work area.

16. After the work area has been inspected by the Engineer and rendered free of visible debris, a thin coat of a pigmented (non-transparent) encapsulating agent shall be applied to all surfaces in the work area from which ACM was removed, to lockdown non-visible fibers.

17. Removal of asbestos containing materials shall be done under negative pressure containment. All OSHA Class I, Class III, and interior Class II asbestos abatement projects shall employ HEPA negative air pressure equipment ventilation. The negative air pressure equipment shall operate continuously, twenty-four (24) hours a day, from startup of negative air pressure equipment, through the cleanup operations. A negative air pressure, relative to areas outside of the enclosure, shall be maintained at all times in the regulated abatement work area during the asbestos abatement project to ensure that contaminated air in the regulated abatement work area does not escape back to an uncontaminated area. A manometer shall be used to document the pressure differential for all OSHA Class I Large and Small size asbestos project regulated abatement work areas. A minimum of -0.02 column inches of water pressure differential, relative to pressure outside the regulated abatement work area, shall be maintained within the regulated abatement work area, as evidenced by manometric measurements.

3.5 CONSULTANT

A. The Owner has retained Langan Engineering (Langan) as the Hazardous Materials Consultant for the purpose of project design, construction administration, and project monitoring during Asbestos Abatement. Mr. Matthew Myers (License #000058) of Langan is the DPH-approved Asbestos Project Designer for this project. The Consultant will represent the Owner in all tasks of the abatement project at the discretion of the Owner. The Asbestos Abatement Contractor will regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion
of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items.

3.6 CONSULTANT'S RESPONSIBILITIES

A. Air sampling shall be conducted by the consultant to ascertain the integrity of controls that protect the building from asbestos contamination. Independently, the contractor shall monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.

B. The consultant's CT DPH licensed asbestos project monitor shall collect and analyze air samples during two time periods:

1. **Abatement Period:** If required, the consultant's project monitor shall collect samples on a daily basis during the work period. A sufficient number of area samples shall be taken outside of the work area, at the exhaust of the negative pressure system, and outside of the building to judge the degree of cleanliness or contamination of the building during removal. Additional samples may be taken inside the work area and decontamination enclosure system, at the discretion of the project monitor.

2. **Post-Abatement Period:** The consultant's project monitor shall conduct air sampling following the final cleanup phase of the project, once the "no visible residue" criterion, as established by the project monitor, has been met. Five (5) samples shall be collected inside the work area utilizing aggressive methods to comply with the State of Connecticut Department of Public Health Standards for Asbestos Abatement, sections 19a-332a-12. Analysis of the samples to determine airborne concentrations of asbestos shall be conducted by Transmission Electron Microscopy (TEM) method with an average limit of 70.0 structures per square millimeter of filter surface or by Phase Contrast Microscopy (PCM) with a limit of 0.010 fibers per cubic centimeters of air in accordance with the above Connecticut regulation sections.

C. The consultant's project monitor shall provide continual evaluation of the air quality of the building during removal, using his/her best professional judgment in respect to the State of Connecticut Department of Public Health guideline of 0.010 fibers/cc and the background air quality established during the pre-abatement period.

D. If the project monitor determines that the building air quality has become contaminated from the project, he/she shall immediately inform the contractor to cease all removal operations and implement a work stoppage clean up procedure. The contractor shall conduct a thorough cleanup of the areas of the building designated by the consultant. No further removal work can take place until the project monitor has assessed that the building air has been decontaminated.

E. Pre-abatement and abatement air samples shall be collected as required to obtain a volume of 1,200 liters. Samples shall be analyzed by Phase Contrast Microscopy (PCM) methodology using the NIOSH 7400 protocol.

3.7 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The consultant shall conduct inspection throughout the progress of the abatement project. Inspections shall be conducted in order to document the progress of the abatement work as well as the procedures and practices employed by the abatement contractor.
B. The consultant shall perform the following inspections during the course of abatement activities:

1. **Pre-commencement Inspection:** Pre-commencement inspections shall be performed at the time requested by the abatement contractor. The consultant shall be informed 12 hours prior to the time the inspection is needed. If, during the course of the pre-commencement inspection, deficiencies are found, the contractor shall perform the necessary adjustments in order to obtain compliance.

2. **Work Area Inspections:** Work area inspections shall be conducted on a daily basis at the discretion of the consultant. During the course of the work inspections, the consultant shall observe the contractor's removal procedures, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the abatement contractor of specific remedial activities if deficiencies are noted.

3. **Pre-encapsulation/Final Visual Inspection:** The consultant, upon the request of the abatement Contractor, shall conduct a pre-sealant inspection. The consultant shall be informed 24 hours prior the time that the inspection is needed. The pre-encapsulation inspection shall be conducted after completion of the all cleaning procedures, but prior to encapsulation. The pre-encapsulation inspection shall verify that all ACM and residual debris have been removed from the work area. If, during the course of the pre-encapsulation inspection, the consultant identifies residual dust or debris, the contractor shall comply with the request of the consultant in order to render the area "dust free."

3.8 **CLEARANCE AIR TESTING**

A. After the visual inspection is completed and all surfaces in the abatement area have dried, final air clearance sampling shall be performed by the consultant. Aggressive air monitoring will be used. Selection of location and samples shall be the responsibility of the consultant. Air monitoring volumes shall be sufficient to provide a detection limit of 0.010 f/cc using NIOSH-approved method for PCM analysis. For air clearance by Transmission Electron Microscopy, air-monitoring volumes shall be sufficient to provide a detection limit of 0.005 f/cc using the AHERA Level II Yamate Method.

B. Areas which do not comply with the Standard for Cleaning for Initial Clearance shall continue to be cleaned by and at the contractor's expense until the specified Standard of Cleaning is achieved as evidenced by results of air testing as previously specified.

3.9 **ASBESTOS WASTE DISPOSAL**

A. The contractor shall package, label, and remove all asbestos waste from the work area in accordance with Connecticut DEEP and DPH regulations, all other applicable regulations, and as specified below. Packaging shall be accomplished in a manner that minimizes waste volume, but insures waste containers shall not tear or break. All waste shall be transported in leak tight containers.

B. Asbestos wastes may include building materials, insulation, disposable clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, contractor equipment, or other materials designated by state or local authorities which have been potentially contaminated with asbestos and have not been fully cleaned.

C. **Waste Labeling**
1. Warning labels, having waterproof print and permanent adhesive in compliance with OSHA, EPA, CT DEEP/DOT and CT DPH requirements, shall be affixed to or printed on the sides of all waste bags or transfer containers. Warning labels shall be conspicuous and legible, and contain the following words:
   
   DANGER
   CONTAINS ASBESTOS FIBERS
   MAY CAUSE CANCER
   CAUSES DAMAGE TO LUNGS
   DO NOT BREATHE DUST
   AVOID CREATING DUST

2. In compliance with NESHAP, 40 CFR, Part 61.150, all waste containers or bags shall be labeled with the following generator information:
   
   a. Name of waste generator
   b. Location of where waste was generated

   D. Wetting of Waste: A fine water spray shall be used to keep the top layers of waste in containers thoroughly wet at all times. When a waste bag is full, air within the bags shall be evacuated with a HEPA equipped vacuum and be securely sealed with tape or other secure fastener.

   E. Use and Decontamination of Fiber Drums: The Contractor's use and decontamination of fiber drums shall be in accordance with CT DPH, EPA and DOT requirements. The drums shall be lined with a minimum of two layers of 6-mil asbestos waste bags. The waste will be appropriately labeled and sealed. The drums shall be sealed with an airtight lid and shall be decontaminated and/or additionally bagged if the drums are filled inside the containment and visible debris/contamination is observed on the exterior of the drums. All waste shall be labeled as previously described. The drums and waste will be re-containerized should their integrity be compromised and/or liquid is visibly passing through or staining the container.

   F. Waste Container Storage: The container used for the storage of bagged contaminated waste shall be an enclosed dumpster. The dumpster shall have a solid metal roof and a solid metal door with padlock. At a minimum, line the cargo area with two layers of a 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and shall extend up the sidewalls 24 inches minimum. Wall sheeting shall be overlapped and taped securely into place. No un-bagged contaminated waste or non-asbestos waste shall be stored in these dumpsters. Ensure that bags placed in dumpsters are undamaged. Warning signs shall be posted on the dumpster in accordance with Sections 29 CFR 1926.1101 of the OSHA regulations.

   G. Waste Removal Scheduling: All waste containers shall be decontaminated and removed from the Site before final cleanup is started and isolation barriers are taken down.

   H. Waste Transportation and Disposal

   1. It is the responsibility of the contractor to determine and insure that the contractor and his/her subcontractor are complying with: 1) current waste handling regulations; and 2) the current regulations for transporting and disposing waste at the ultimate disposal landfill. The contractor must comply fully with these regulations, and with all U.S. Department of Transportation, State, local, and EPA requirements.
2. The contractor's waste hauler and disposal contractor shall maintain a valid hazardous waste transporter's permit and identification number; and obtain complete, and fully comply with any other local hazardous waste manifesting requirements.

3. Exercise care before and during transport to ensure that no unauthorized persons have access to the containerized ACW.

4. Do not transport ACW on open trucks. Treat and dispose of drums that have been contaminated as asbestos-containing waste.

5. A copy of ACW manifest forms shall be sent to the Owner after each disposal is completed and all required data and signatures have been inserted.

6. The contractor shall return the original Disposal Certificate (landfill receipt) to the Owner within 10 working days of waste shipment from the Site.

END OF SECTION 028213
SECTION 028313 – LEAD-BASED PAINT AWARENESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Refer to all drawings and/or other Sections of these specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

C. Sections containing requirements related to this Section include, but are not limited to:

1. Section 028200 – Selective Hazardous Building Materials Abatement Demolition
2. Section 028213 – Asbestos Abatement
3. Section 028416 – Universal Waste Removal and Recycling
4. Section 028433 – PCBs Less than 50 PPM Remediation
5. HBM – 01 – Hazardous Building Materials Abatement Drawing

1.2 SUMMARY OF WORK

A. Work of this Section includes, requirements for worker protection and waste disposal related to the renovation/demolition work involving components and surfaces containing lead at the H. Smith Richardson Golf Course Clubhouse Facility Site located in Fairfield, Connecticut. All materials should be considered to contain lead.

B. The procedures referenced herein shall be utilized during required demolition work specified elsewhere in the Architect’s Specification that might impact lead.

C. The demolition impacting ceramic block may result in dust and debris exposing workers to levels of lead above the OSHA Action Level. Worker protection, training, and engineering controls referenced herein shall be strictly adhered to, until completion of exposure assessment with results indicating exposures below the "Action Level". This section does not involve lead abatement by CT DPH regulation, but identified worker protection requirements for trades involved in the demolition and disposal procedures if lead is involved in the waste stream.

1.3 DEFINITIONS

A. The following definitions relative to lead paint as used in this Section are offered:

1. Action Level (AL): The allowable employee exposure, without regard to use of respiratory protection, to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current action level is thirty micrograms per cubic meter of air (30 µg/m³).

2. Area Monitoring: The sampling of lead concentrations, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
3. **Biological Monitoring**: The analysis of a person's blood and/or urine, to determine the level of lead concentration in the body.

4. **Change Room**: An area provided with separate facilities for clean protective work clothing and equipment and for street clothes, which prevents cross-contamination.

5. **Competent Person**: A person employed by the Contractor who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA.

6. **Exposure Assessment**: An assessment conducted by an employer to determine if any employee may be exposed to lead at or above the action level.

7. "**High Efficiency Particulate Air**" (HEPA): A type of filtering system capable of filtering out particles of 0.3 microns diameter from a body of air at 99.97% efficiency or greater.

8. **Lead**: Refers to metallic lead, inorganic lead compounds and organic lead soaps. Excluded from this definition are other organic lead compounds.

9. **Lead Work Area**: An area enclosed in a manner to prevent the spread of lead dust, paint chips, or debris resulting from lead-containing paint disturbance.

10. **Lead Paint**: Refers to paints, glazes and other surface coverings containing a toxic level of lead.

11. **Permissible Exposure Limit (PEL)**: The maximum allowable limit of exposure to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current PEL is fifty micrograms per cubic meter of air (50 µg/m³). Extended workdays lower the PEL by the formula: PEL equals 400 divided by the number of hours of work.

12. **Personal Monitoring**: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62 and 29 CFR 1910.1025. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a sphere with a radius of 18 inches and centered at the nose or mouth of an employee.

13. **Resource Conservation Recovery Act (RCRA)**: RCRA establishes regulatory levels of hazardous chemicals. There are eight (8) heavy metals of concern for disposal: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Six (6) of the metals are typically found in paints, excluding selenium and silver.

14. **Toxic Level Of Lead**: A level of lead, when present in dried paint or plaster, contains more than 0.50% lead by dry weight as measured by atomic absorption spectrophotometry (AAS) or 1.0 mg/cm² as measured by on-site testing utilizing an x-ray fluorescence analyzer. (Term is specific to State of CT regulations and HUD guidelines only)

15. **Toxicity Characteristic Leachate Procedure (TCLP)**: The U.S. Environmental Protection Agency (US EPA) required sample preparation and analysis for determining the hazard characteristics of a waste material.

1.4 **REGULATIONS AND STANDARDS**

A. The following regulations, standards, and ordinances of federal, state, and local agencies are applicable and made a part of this specification by reference:

   a. 29 CFR 1910.134 - Respiratory Protection
   b. 29 CFR 1910.1025 - Lead
c. 29 CFR 1926.62 - Lead in Construction Interim Final Rule  
d. 29 CFR 1910.1200 - Hazard Communication  
e. 29 CFR 1926.59 - Hazard Communication in Construction  
f. 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists  
g. 29 CFR 1926.57 - Ventilation  
h. 40 CFR 260 - Hazardous Waste Management Systems: General  

3. 40 CFR 261 - Identification and Listing of Hazardous Waste  
4. 40 CFR 262 - Generators of Hazardous Waste  
5. 40 CFR 263 - Transporters of Hazardous Waste  
6. 40 CFR 264 - Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities  

a. 40 CFR 265 - Interim Statutes for Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities  
b. 40 CFR 266 - Lead Disposal Restrictions  
c. 40 CFR 172 - Hazardous Materials Tables and Communication Regulations  
d. 40 CFR 178 - Shipping Container Specifications  
e. 40 CFR 270 and 124 - Hazardous Waste Permits  

8. Underwriters Laboratories, Inc. (UL) UL586 - 1990 High Efficiency Particulate Air Filter Units  

1.5 QUALITY ASSURANCE  

A. Hazard Communication Program  
The Contractor shall establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.  

B. Compliance Plan (Site Specific)  
The contractor shall establish a written compliance plan, which is specific to the project site, to include the following:  

1. A description of work activity involving lead including equipment used, material included, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.  
2. Methods of engineering controls to be used to control lead exposure.  
3. The proposed technology the Contractor will implement in meeting the PEL.  
4. Air monitoring data documenting the source of lead emissions.  
5. A detailed schedule for implementing the program, including documentation of appropriate supply of equipment, etc.  
6. Proposed work practice which establishes proper protective work clothing, housekeeping methods, hygiene facilities, and practices.  
7. Worker rotation schedule, if proposed, to reduce TWA.  

C. Hazardous Waste Management  
The Contractor shall establish a Hazardous Waste Management Plan, which shall comply with applicable regulations and address the following:  

1. Identification of hazardous wastes  
2. Estimated quantity of waste to be disposed of
3. Names and qualifications of each sub-contractor that will be transporting, storing, treating, and disposing of wastes
4. Disposal facility location and 24 hour point of contact
5. Establish EPA state hazardous waste and identification numbers if applicable
6. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes
7. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, if applicable, and transport equipment
8. Qualifications of laboratory to be utilized for TCLP sampling and analysis
9. Spill prevention, containment, and cleanup contingency measures
10. Work plan and schedule for waste containment, removal, treatment, and disposal

D. Medical Examinations

2. The examination shall not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62 within the last year.
3. Medical examination shall include, at a minimum, approval to wear respiratory protection and biological monitoring.

E. Training

1. The Contractor shall ensure that workers are trained to perform lead paint disturbing activities and disposal operations prior to the start of work in accordance with 29 CFR 1926.62.

F. Respiratory Protection Program

1. The Contractor shall furnish each employee required to wear a negative pressure respirator with a respirator fit test at the time of initial fitting and at least once every six (6) months thereafter as required by 29 CFR 1926.62.

1.6 SUBMITTALS

A. The Contractor shall submit to the Owner the following submittals prior to start of work:

1. Copies of medical records for each employee to be used on the project, including results of biological monitoring and a notarized statement by the examining physician that such an examination took place.
2. Copies of workers' training certificates.
3. Submit record of successful respirator fit testing performed by a qualified individual within the previous six (6) months, for each employee to be used on this project with the employee's name and social security number with each record.
4. The name and address of Contractor's blood lead testing lab, OSHA-CDC listing, and Certification in the State of Connecticut.
5. The name and address of Contractor's personal air monitoring and waste disposal lead testing laboratory/ies.
6. Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.

B. The Contractor shall submit to the Owner the following submittals during the job:

1. Results from personal air samples.
2. Medicals, certificates, and fit test 24 hours in advance of any new employee starting on the project.

C. The Contractor shall submit to the Owner the following submittals upon completion of the work:

1. Copies of manifests and receipts acknowledging disposal of all hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.

1.7 PERSONAL PROTECTION

A. Exposure Assessment

1. The Contractor shall determine if any worker will be exposed to lead at or above the action level.
2. The exposure assessment shall identify the level of exposure a worker would be subjected to without respiratory protection.
3. The exposure assessment shall be achieved by obtaining personal monitoring samples representative of a full shift at least (8-hour TWA).
4. During the period of the exposure assessment, the Contractor shall institute the following procedures for protection of workers.
   a. Protective clothing shall be utilized
   b. Respiratory protection
   c. Change areas shall be provided
   d. Hand washing facilities and shower
   e. Biological monitoring
   f. Training of workers

B. Respiratory Protection

1. The Contractor shall furnish appropriate respirators approved by NIOSH/MSHA for use in atmospheres containing lead dust.
2. Respirators shall comply with the requirements of 29 CFR 1926.62.
3. Workers shall be instructed in all aspects of respiratory protection.
4. The Contractor shall have an adequate supply of HEPA filter elements and spare parts on site for all types of respirators in use.
5. The following minimum respirator protection for use during paint removal or demolition of components and surfaces with lead paint shall be the 1/2 mask air purifying respirator with high efficiency filters for exposures (not in excess of 500 ug/m³ or 10 x PEL).

C. Protective Clothing

1. Personal protective clothing shall be provided for all workers, supervisors, and authorized visitors entering the work area.
2. Each worker shall be provided with a minimum of two (2) complete disposable coverall suits.
3. Removal workers shall not be limited to two (2) suits, and the Contractor shall supply additional suits as necessary.
4. Under no circumstances shall anyone entering the abatement area be allowed to re-use a contaminated disposable suit.
5. Disposable suits, such as TYVEK suits, and other personal protective equipment (PPE) shall be donned prior to entering the lead control area. A change room shall be provided for workers to put on suits and other personal protective equipment with separate areas to store their street clothes.
6. Eye protection for personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.
7. Goggles with side shields shall be worn when working with power tools or a material that may splash or fragment, or if protective eye wear is specified on the Material Safety Data Sheet (MSDS) for a particular product to be used on the project.

1.8 PERSONAL MONITORING

A. General: The Contractor is required to perform the personal air sampling activities during lead paint disturbing work. The results of such sampling shall be posted, provided to individual workers and submitted to the Owner as described herein.

B. Sampling: Samples shall be taken for the duration of the work shift or for eight hours, whichever is less. Personal samples need not be taken every day after the first day if working conditions remain unchanged, but must be taken every time there is a change in removal operations, either in terms of the location or the type of work. Sampling will be used to determine eight-hour Time-weighted averages (TWA). The Contractor is responsible for personal sampling as outlined in OSHA Standard 29 CFR 1926.62 and 29 CFR 1910.1025.

C. Sampling Results: Air sampling results shall be reported to individual workers in written form no more than forty-eight (48) hours after the completion of a sampling cycle. The reporting document shall list each sample’s result, sampling time and date, personnel monitored and their social security numbers, flow rate, sample duration, sample yield, cassette size, and analysts’ name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in micrograms/cubic meter (µg/m³).

D. Testing Laboratory: The Contractor's testing lab shall be participating in AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP). The Contractor shall submit to the Consultant for review and acceptance, the name and address of the laboratory, certification(s) of AIHA participation, a listing of relevant experience in air lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

PART 2 - PRODUCTS

2.1 GENERAL

A. Any substitution in materials, equipment, or methods to those specified shall be approved by the Owner prior to use. Any requests for substitution shall be provided in writing to the Owner. The request shall clearly state the rationale for the substitution.
B. Submit to the Owner product data of all materials and equipment and samples of all materials to be considered as an alternate.

C. Product data shall consist of manufacturer; catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, safety data sheets (SDS), and other standard descriptive data. Submittal data shall be clearly marked to identify pertinent materials, products or equipment and show performance characteristics and capacities.

D. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product or material with integrally related parts and attachment devices.

2.2 MATERIALS AND PRODUCTS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape, and air filters.

D. Materials:
   1. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating 6 mil.
   2. Polyethylene disposable bags shall be six (6) mil. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.
   3. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
   4. Impermeable containers are to be used to receive and retain any lead containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with EPA and DOT standards.)
   5. HEPA filtered exhaust systems shall be used during powered dust generating abatement operations. The use of powered equipment without HEPA exhausts is prohibited.

2.3 TOOLS AND EQUIPMENT

A. Provide suitable tools for all lead disturbing operations.

B. The Contractor shall have available power cables or sources such as generators (where required).

C. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter.

PART 3 - EXECUTION

3.1 WORKER PROTECTION/TRAINING
A. The Contractor shall provide appropriate training, respiratory and other personal protection, and biological monitoring for each worker and ensure proper usage during potential lead exposure and the initial exposure assessment.

B. Workers who will perform procedures must have completed one of the following training courses:
   1. EPA Lead Abatement Supervisor (40 hours)
   2. EPA Lead Abatement Worker (32 hours)
   3. HUD/EPA course "Work Smart, Work Wet, and Work Clean to Work Lead Safe" (8 hours)
   4. HUD/NARI course "The Remodeler's and Renovator's Lead Based Paint Training Program" (8 hours).
   5. HUD "Lead Safe Work Practices" (8 hours)

3.2 CONTRACTOR'S RESPONSIBILITIES
A. The Contractor is responsible for establishing and maintaining controls referenced herein to prevent dispersal of lead contamination from the lead work area.

B. The Contractor is also responsible for conducting work with applicable federal, state, and local regulations as referenced herein.

3.3 WORKER HYGIENE PRACTICES (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA ACTION LEVEL)
A. Work Area Entry: Workers shall don personal protective equipment prior to entering work area, including respiratory protection, disposable coveralls, gloves, headgear, and footwear.

B. Work Area Departure: While leaving respirators on, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to change room and remove coveralls and footwear and place in hazardous waste disposal container.

C. Hand washing Facilities: All workers must wash their hands and faces upon leaving the work area.

D. Equipment: All equipment used by workers inside the work area shall be wet wiped or bagged for later decontamination before removal from the work area.

E. Prohibited Activities: Under no circumstances shall workers eat, drink, smoke, chew gum, or tobacco, or remove their respirators in the work area.

F. Shock Hazards: The Contractor is responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground fault circuit interrupters (GFI).

3.4 LEAD WORK AREA (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA ACTION LEVEL)
A. The Contractor shall place warning signs at all entrances and exits from the work area. Signage shall be a minimum of 20" x 14" and shall state the following:
DANGER
LEAD WORK AREA
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK OR SMOKE IN THIS AREA

B. The Contractor shall designate a change room as specified in this Section. The change room shall consist of two (2) layers of sheeting on the floor surface adjacent to the lead work area. The change room shall have separate storage facilities for street clothes to avoid cross contamination.

C. The Contractor shall provide potable water for hand and face washing and provide a portable shower unit.

D. The Contractor shall place six-mil polyethylene drop cloths on floor/ground surfaces prior to beginning removal work to facilitate clean-up.

3.5 WORK AREA CLEAN UP

A. The Contractor shall remove all loose chips and debris from floor surfaces and place in hazardous waste disposal bags.

B. The Contractor shall HEPA vacuum adjacent surfaces to remove dust and debris.

C. Polyethylene drop cloths shall be properly disposed of.

3.6 WASTE DISPOSAL

A. The Contractor's contractual liability shall be the proper disposal of all non-hazardous and hazardous wastes generated at the site in accordance with all applicable federal, state, and local regulations as referenced herein. Metal lead based paint components may be segregated for recycling at an approved facility. TCLP sampling from the building should be performed to classify the proper disposal for painted building materials (normal construction debris versus regulated hazardous waste). The contractor will be responsible for all costs associated with lead/hazardous waste disposal should they, their haulers and/or the landfill of their choosing take samples and declare the waste as lead hazardous waste.

END OF SECTION 028313
SECTION 028416 - UNIVERSAL WASTE REMOVAL AND RECYCLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Refer to all drawings and/or other Sections of these specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

C. Sections containing requirements related to this Section include, but are not limited to:

1. Section 028200 – Selective Hazardous Building Materials Abatement Demolition
2. Section 028213 – Asbestos Abatement
3. Section 028313 – Lead-Based Paint Awareness
4. Section 028433 – PCBs Less than 50 PPM Remediation
5. HBM – 01 – Hazardous Building Materials Abatement Drawing

1.2 SUMMARY OF WORK

A. Work of this Section includes, but is not necessarily limited to, all which is necessary for complete removal and recycling/disposal of all PCB-containing ballasts, newer ballasts, mercury containing devices, electronics, alarms, smoke detectors, sensors, emergency lighting, signage, paints, chemicals, chemicals/contaminated piping/waste traps, batteries, air conditioning units, CFC’s, kitchen materials, boiler and HVAC controls, other hazardous materials, wastes and special wastes that exist in the interior/exterior of the building structure(s) that might be impacted by proposed demolition. The hazardous materials contractor will supply the packaging materials and pay for the proper disposal of these materials. The hazardous materials contractor will provide the labor to put the materials into the proper packaging for disposal.

1. All work including the removal, characterization (any testing that may be required by disposal facility) and disposal of hazardous materials and chemicals.
2. Removal, characterization (any testing that may be required by disposal facility) and disposal of fluorescent light ballasts and capacitors throughout all site structures.
3. Removal, characterization (any testing that may be required by disposal facility) and disposal of all containers, drums and unknown materials as well as fire extinguishers.
4. Removal, characterization (any testing that may be required by disposal facility) and disposal of contained gear oils, hydraulic oils and refrigeration liquids, etc. from various pieces of equipment.
5. Removal, characterization (any testing that may be required by disposal facility) and recycling/disposal of batteries, electronic devices, lighting signage, etc.
6. Removal, characterization (any testing that may be required by disposal facility) and recycling/disposal of science equipment, contaminated piping, chemicals, waste traps, etc.
7. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.


B. The Contractor, under this Section, shall provide all materials, labor, equipment and appliances as necessary to properly remove and recycle/dispose of materials.

1.3 DESCRIPTION OF WORK

A. This specification covers the proper and legal removal and disposal of all Hazardous/Universal Waste from the H. Smith Richardson Golf Course Clubhouse Facility Site located in Fairfield, Connecticut. The removal and disposal activities shall comply with all aspects of the contract documents and federal, state and local requirements.

B. Universal Wastes shall include, but not be limited to, fluorescent bulbs, light fixture ballasts containing polychlorinated bi-phenyls (PCBs) or DEHP, mercury lamps, mercury containing devices, electronics, alarms, smoke detectors, sensors, emergency lighting, signage, paints, chemicals, chemicals/contaminated piping/waste traps, batteries, air conditioning units, CFC’s, boiler and HVAC controls, other hazardous materials, wastes and special wastes that exist in the interior/exterior of the building structure(s) that might be impacted by demolition of selected buildings/structures. Whenever there is a conflict or overlap within these specifications and between applicable codes and regulations, the most stringent provision specified shall apply.

C. The H. Smith Richardson Golf Course Clubhouse Facility was constructed in 1972. It is one story building and has an adjacent boiler room, golf cart barn, storage shed, marshal/superintendent booth structures and the approximate total square footage is 10,350 square feet.

D. The proposed redevelopment consists of demolition of selected buildings/structures.

E. The Contractor shall independently identify and quantify all Universal Waste Items.

1.4 SUBMITTALS

A. Before Start of Work: Submit the following to the Owner's Representative for review. Do not start work until these submittals are returned with Owner's Representative's approval.

1. Copy of State or local license for hazardous waste hauler;
2. Certification of at least one on-site supervisor which has satisfactorily completed the OSHA 40 Hour Health and Safety Course for Handling Hazardous Materials;
3. Certificates of workers which have successfully completed at least the OSHA 40-Hour Health and Safety Course for Hazardous Materials;
4. Certificates of workers which have successfully completed the required employee training for universal/hazardous waste or appropriate type of training to the type of wastes being managed;
5. Name and address of the universal waste handler and/or a destination facility where the waste materials is to be treated, deposited or recycled in accordance with all regulatory requirements (include contact person and telephone numbers), if the universal waste meets the definition of hazardous waste, the name and address of the hazardous waste treatment, storage and disposal (TSD) facility;
6. Work Plan: Provide a detailed written work plan that describes the procedures for the removal,
   a. Proposed level of worker training for each type of regulated and/or hazardous material to be removed.
   b. Names and applicable licenses of key personnel.
   c. Proof of appropriate training for workers.
   d. Proof of a current medical surveillance program for all personnel.
   e. Safety Data Sheets (SDS) for any chemicals to be used on the project. All products to be used on this project must have SDS approved by the Owner’s Environmental Consultant.
   f. Proposed detailed work schedule.

7. Following final removal, and disposal or destruction, provide Owner with waste transport and disposal documents (e.g., manifests), as well as certificates of destruction and recycling as appropriate.

1.5 CODES AND REGULATIONS

A. Regulatory compliance includes but is not necessarily limited to applicable requirements set forth by:

1. Federal Regulations:
   a. 29 CFR 1910, “Occupational Safety and Health Standards” (General Industry Standards)
   d. 29 CFR 1926, “Safety and Health Regulations for Construction” (Construction Industry Standards)
   e. 40 CFR 50, “National Primary and Secondary Ambient Air Quality Standards”
   g. 40 CFR 117, “Determination of Reportable Quantities for Hazardous Substances”
   h. 40 CFR 122, “USEPA Administered Permit Program: The National Pollutant Discharge Elimination System”

2. 40 CFR 172, “Hazardous Waste Transportation”
   d. 40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan”
   e. 40 CFR 302, “Designation, Reportable Quantities, and Notification”
   f. 40 CFR 112 (oil pollution prevention)
   g. 40 CFR 279 (used oil)
   h. 40 CFR 273 (Universal Wastes)
   i. 40 CFR 761 (PCBs)
j. Toxic Substances Control Act (TSCA), US-EPA

5. Resource Conservation and Recovery Act (RCRA)
   a. Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) (Superfund Law)

6. Connecticut Regulations:
   State requirements which govern universal waste removal and disposal include but are not
   necessarily limited to the following:
   a. Connecticut Department of Environmental Protection (DEEP) (Hazardous and
      Universal Waste Management Regulations); Section 22a-454, 456 Waste Facility
      and Section 22a-449(c)-113 of the Regulations of Connecticut State Agencies
      (RCSA), respectively.
   b. Connecticut DEEP; 310 CMR 40 Connecticut Contingency Plan, 310 CMR 30
      Hazardous Waste Regulations, 310 CMR 1-7 Clean Water Act, 310 CMR 16, 19
      Solid Waste Regulations, 314 CMR 1-8 Clean Air Act
   c. Local Town, City or County Bylaws, rules and regulations.

B. Under TSCA, items that contain more than 500 parts per million (PPM) of PCBs are classified as
   PCB material, items that contain between 50 ppm and 500 ppm of PCB are classified as PCB-
   contaminated and items that contain less than 50 ppm of PCBs are classified as non-PCB items.

Under the Small Capacitor Exemption, TSCA has allowed the disposal of non-leaking, intact
“small capacitors”, defined as containing less than three pounds of PCB dielectric fluid, in a
municipal solid waste landfill. Light ballasts containing a small PCB capacitor are covered under
this category. The intent of the “small capacitor” disposal rule is for “random disposal” in a
landfill by “householders and other infrequent disposers”. When commercial and industrial
entities dispose of large quantities of small PCB capacitors, the EPA strongly encourages
voluntary collection and disposal of PCB capacitors in chemical waste landfills or high-
temperature incinerators.

C. Under the “Superfund” laws, PCBs are specifically listed as a hazardous substance. The “release”
of more than one pound of PCBs into the environment triggers a “Superfund” notification and
cleanup requirement.

Since twenty-five ballasts collectively contain approximately one pound of PCBs, the disposal of
twenty five or more PCB-containing ballast in a landfill would trigger a “Superfund” action.

D. The State of Connecticut General Hazardous Waste Statue 22A 454, 456 requires that PCB ballast
must be incinerated or sent to a chemical waste landfill. The statute defines PCB waste, including
PCB ballast, as Connecticut Regulated Wastes.

E. Other Regulations: The other relevant regulations affecting disposal of PCBs include the
   following:
   1. Department of Transportation (DOT) regulations – DOT regulation HM-181 regulates
      transportation of hazardous materials, including PCBs.
   2. Occupational Safety and Health Administration (OSHA) – OSHA regulates worker’s
      safety and exposure to a variety of chemicals including PCB’s.
3. Resource Conservation and Recovery Act (RCRA) – RCRA regulates wastes, which fail Toxic Characteristic Leachate Procedure (TCLP) and which contain more than 50 ppm of PCBs.

PART 2 - PRODUCTS

2.1 GENERAL

A. 35 or 55-gallon metal, fiber drums or containers with lids that can be secured and sealed, DOT approved.

B. Appropriate waste labels identifying contents as regulated and hazardous wastes as defined by 49 CFR 172.

C. Fluorescent Lamp Disposal (Crusher) units, such as DexTrite Fluorescent® Lamp Disposal equipment, or equivalent. Such equipment must be capable of capturing fugitive mercury vapors during the bulb crushing process, as well as the fractured and broken waste products.

D. HEPA and charcoal filter equipped mercury capture vacuum.

E. Cardboard boxes and sleeves for packaging lamps that will be removed from the site intact or unbroken.

F. Recovery tanks to temporarily hold compressed gasses.

G. Health & Safety equipment complying with health and safety plan.

PART 3 - EXECUTION

3.1 GENERAL

A. Procedures and methods contained herein are to provide guidance to protect from the contamination of the environment, and exposure to workers, while handling hazardous waste and regulated waste-streams for disposal/recycling/destoy ration.

B. Owner to Stop Work: The Owner's representative and the Owner's Environmental Consultant shall have the authority to stop the work at any time that conditions are not within Specification and/or applicable regulations. The stoppage of work shall continue until conditions have been corrected to the satisfaction of the Owner's representative or Owner's Environmental Consultant. Standby time to resolve the problems shall be at the Contractor's expense.

C. Personal Protective Equipment:

1. Personal protective equipment shall consist of (at a minimum) safety goggles or other protective eye-ware, work shoes with non-slip soles (e.g., neoprene), chemical resistant gloves that cover the hand and an apron that covers the front of the worker's body from shoulder to toes (e.g., neoprene or nitrile gloves).
2. Personal protective equipment contaminated by handling operations should be disposed of as contaminated waste.
3. Hammering or sudden impact methods for removing ballast's from the light fixture shall not be employed, as such methods may cause leakage in an otherwise non-leaking ballast.
4. Throwing and tossing of ballast's into disposal drums shall not be conducted, as such activities may cause leakage in an otherwise non-leaking ballast.

D. Work Procedures

1. Contractor shall obtain a hazardous waste generator number from Region I, US EPA for the Owner.
2. During the light fixture removal stage during demolition, the following procedures (or equivalent alternate but protective measures) shall be followed:
   a. Carefully remove fixtures, and stack them in a designated portion of the work area.
   b. Designate an area where the fixtures can be disassembled, and components removed and segregated (e.g., lamps, ballasts). The area should be remote from other demolition activities, and have adequate ventilation and lighting.
   c. The work area for fixture disassembly shall (at a minimum) have the floor lined with one layer of 6-mil fire-retardant polyethylene plastic to control accidental spills or breakage. The work area should have a table or other solid work platform to facilitate disassembly of the fixtures, and the protective plastic sheeting should cover the work table area and waste drums/lamp crushing/lamp repackaging equipment.
   d. Carefully remove lamps from fixtures, and either crush them or repackage them for disposal.
   e. In the event a lamp breaks, utilize the mercury capture vacuum to remove all debris generated.

3. Carefully remove ballasts, and segregate for disposal in the following manner:
   a. Ballasts labeled as "No-PCBs" shall NOT be segregated and shall be treated as PCB waste as potting material may contain PCBs and DEHP. Handle and dispose of in the same manner as ballasts containing PCBs and/or DEHP.
   b. Non-leaking ballasts shall be segregated and drummed for disposal as hazardous wastes. These ballasts may be destroyed by high temperature incineration, or land filled at a properly permitted facility.
   c. Leaking ballasts shall be segregated and drummed. Punctures or damage to these ballasts exposes an oily or tar-like substance. These ballasts, and all materials it contacts, MUST be incinerated under TSCA; they cannot be landfilled.

E. Miscellaneous Stored Materials In Containers

1. Miscellaneous materials may include antifreeze, cleaning solutions, paints, and other miscellaneous materials.
2. During removing/recycling of materials enclosed in their original container, the Contractor shall package, and label (lab packed) by waste classification in accordance with appropriate RCRA and Connecticut Department of Transportation (ConnDOT). In turn these containers shall be transported, under proper manifesting procedures, to a recycling facility. The facility shall forward a certificate of recycling or disposal to the Contractor, who shall submit this information to the Owner.
F. Universal Waste

Universal waste includes, but is not limited to, fluorescent bulbs, light fixture ballasts containing polychlorinated bi-phenyls (PCBs) or DEHP, mercury lamps and switches, batteries, fire extinguishers, Halon fire suppression systems, paint, refrigerants, electronic devices (computers and monitors), and other compressed gases, mechanical fluids, oils, and lubricants, as defined in 40 CFR 273 and Section 22a-449(c)-113 of the Regulations of Connecticut State Agencies (RCSA). Follow procedures for handling, storage, labeling, shipping, recording keeping and other procedures as required in 40 CFR 273 and Section 22a-449(c)-113.

G. Regulated Waste

1. Non-thermostat mercury switches: Handle and dispose of in accordance with State regulation and applicable Federal regulations.
2. Used oil: Handle and dispose of in accordance with State regulations.
3. Refrigerants: Prior to disposal of refrigerant containing equipment, verify that refrigerant has been removed per the requirements of 40 CFR Part 82 (Protection of Stratospheric Ozone).
4. Diesel fuel: If possible, use on site to run equipment. Dispose of or recycle any remaining fuel as per applicable regulations.
5. Fire extinguishers: Contact manufacturer for recycling or donate to local fire department.
6. Halon Fire Suppression System: For recovery and management of Halon, utilize a technician EPA certified in appropriate level for the system. Technician is to use an EPA-certified reclamer for disposal.

H. Transportation

1. Transport waste materials using properly permitted vehicles operated by drivers with Commercial Drivers Licenses (CDLs) and Hazardous Materials endorsements. Coordinate transportation routes with Connecticut Department of Transportation (ConnDOT). Provide Owner with copies of transporter certifications and EPA ID number a minimum of seven (7) days prior to first use. Chain of custody records shall be maintained which include the date of pickup, number of drums, name of transporter and destination.

I. Waste Disposal Documentation

1. Waste shipment records and manifests for all materials transported from the site as required by regulations and disposal facility are to be provided to the Owner every five (5) business days. Incorporate this information into the close out package to be provided to the Owner. Within thirty (30) days of generation, Contractor shall provide waste manifests/shipment records and Certificates of Recycling and Disposal (CRD) to Owner.
2. Certificates of Discontinuance for all equipment and fixtures.

J. Disposal Facilities

1. Contractor shall use only disposal facilities which have been pre-approved by the Owner and its insurers and with valid regulatory permits for type of waste being handled. Provide Owner with copies of disposal facility regulatory permits and EPA identification number.
a minimum of seven (7) days prior to shipping to that facility. Provide disposal facility required documentation including additional waste sampling.

END OF SECTION 028416
SECTION 028433 - PCBS LESS THAN 50 PPM REMEDIATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Supplementary Conditions apply to this Section.

B. Sections containing requirements related to this Section include, but are not limited to:

1. Section 028200 – Selective Hazardous Building Materials Abatement Demolition
2. Section 028213 – Asbestos Abatement
3. Section 028313 – Lead-Based Paint Awareness
4. Section 028416 – Universal Waste Removal and Recycling
5. HBM – 01 – Hazardous Building Materials Abatement Drawing

1.2 CONSULTANT

A. Langan Engineering (Langan) has been retained as the Consultant for the purposes of construction administration and project monitoring during PCB Remediation. The Consultant will represent the Owner in all phases of the remediation project at the discretion of the Owner. The PCB Remediation Contractor shall regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the remediation, submission of data, and daily field punch list items.

1.3 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the PCB Remediation Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the PCB Remediation Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with applicable Codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern.

C. It is not intended that the Specifications show every detail of the Work, but the PCB Remediation Contractor shall be required to furnish within the Contract Sum all material and labor necessary for the completion of the Work in accordance with the intent of the Specifications.

D. In case of ambiguity among the Contract Documents, the more stringent requirement as determined by the Consultant shall prevail.

E. The Work of this Contract includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.

F. All items, not specifically mentioned in the Specifications but implied by trade practices to complete the work, shall be included.
1.4 EXAMINATION OF THE SITE

A. It is understood that the PCB Remediation Contractor has examined the Site and made his/her own estimates of the facilities and difficulties attending the execution of the Work, and has based his price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the PCB Remediation contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.5 CONTRACTOR QUALIFICATIONS

A. All bidders shall submit a record of prior experience in PCB remediation projects, specifically including removal of PCB-containing materials listing no less than three (3) completed jobs in the past year, with all projects being of similar size and scope. The PCB Remediation Contractor shall list the experience and training of the project foremen and all on-site personnel. The information that should be included is as follows:

1. Project Name and Address
2. Owner's Name and Address
3. Architect/Consultant
4. Contract Amount
5. Date of Completion
6. Extras and Changes

B. Submit a written statement regarding whether the PCB Remediation Contractor has ever been found out-of-compliance with federal or state regulations pertaining to worker protection, removal, transport, or disposal.

1.6 TESTING LABORATORY SERVICES

A. The PCB Remediation Contractor shall submit to the Consultant the name; address and qualifications of proposed laboratories intended to be utilized for sample analysis as required by this section.

1.7 GENERAL REQUIREMENTS

A. The PCB Remediation Contractor shall furnish all labor, materials, facilities, equipment, installation services, employee training, notifications, permits, licenses, certifications, agreements, and incidentals necessary to perform the specified work. Work shall be performed in accordance with the Contract Documents, the latest regulations from the Occupational Safety and Health Administration (OSHA), the United States Environmental Protection Agency (US EPA), and all other applicable federal, state, and local agencies. Whenever the requirements of the above references conflict or overlap, the more stringent provision shall apply.

B. All project personnel engaged in the work covered under this section shall be trained in accordance with OSHA Regulations 29 CFR 1910.1000 and 29 CFR 1910.1200. It should also be noted that work associated with PCB removal may also involve exposure to PCBs during demolition and removal activities specified herein and the PCB Remediation Contractor shall perform required exposure assessment for PCBs.
C. The PCB Remediation Contractor shall provide a Project Health and Safety Officer having a minimum of eight (8) hours of supervisor training in hazardous waste site operations in accordance with the requirements of 29 CFR 1910. The supervisor must be on-site at all times during remediation work. This supervisor and other contractor representatives must attend a pre-remediation meeting to be scheduled by the building owner/owners representative.

D. This section specifies the procedures for removal of existing source products containing polychlorinated biphenyls (PCBs) less than (<) 50 parts per million (ppm) in the form of interior and exterior source window caulking/sealant compounds throughout the main building – assume multiple layers of sealant, accessible and inaccessible and all adjacent substrates contaminated) (estimate 20 openings of varying sizes - asbestos containing as well). The product is not regulated for removal and disposal in accordance with federal requirements of 40 CFR Part 761 as they meet the definition of an "Excluded PCB product", however is regulated in accordance with State of Connecticut Department of Energy and Environmental Protection (CT DEEP) requirements as PCB-Containing Material due to the presence of more than 1 ppm of PCBs in the product. The materials are considered excluded PCB products by definition (40 CFR § 761.3) as they were original to the building (<50 ppm PCB, manufactured and installed prior October 1, 1984 and not a result of contamination from another source containing >50 ppm PCB). The contractor must dispose of segregated Remediation Waste (waste from remediation - suits, polyethylene sheeting, towels/rags, respirator cartridges, etc.) also.

E. Disturbance or removal of polychlorinated biphenyls (PCB) containing materials may cause a health hazard to workers and building occupants. The PCB Remediation Contractor shall disclose to all of his workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

F. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of PCB-Containing Materials, appropriate, continuous measures as necessary to protect all workers from the hazard of exposure shall be taken. Such measures shall include the procedures and methods described herein, regulations of the OSHA, US EPA, and local requirements as applicable.

G. The PCB Remediation Contractor shall employ a Competent Person (Supervisor) with at least three (3) years’ experience on projects of similar scope and magnitude who shall be responsible for all work involving PCB remediation as described in the specifications and defined in applicable regulations, and have full time daily supervision of the same. The Supervisor shall be the Competent Person as defined by OSHA regulations and have experience in the proper removal and disposal of PCB-Containing Materials.

H. The PCB Remediation Contractor shall allow the work of this contract to be inspected, if required, by local, state, federal, and any other authorities having jurisdiction over such work. The PCB Remediation Contractor shall immediately notify the Owner and Consultant and shall maintain written evidence of such inspection for review by the Owner and Consultant.

I. The PCB Remediation Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The PCB Remediation Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.

J. The PCB Remediation Contractor shall immediately notify the Owner and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or occupancy, etc., and
any other such instruments required under codes by authorities having jurisdiction, regardless of who issued, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

K. The PCB Remediation Contractor shall provide enough labor to guarantee completion of the work within the time frame given and within the normal operating hours of the buildings.

1.8 SCOPE OF WORK

A. This specification covers the proper and legal removal and disposal of all materials affected by planned demolition: interior and exterior source window caulking/sealant compounds throughout the main building – assume multiple layers of sealant, accessible and inaccessible and all adjacent substrates contaminated (estimate 20 openings of varying sizes - asbestos containing as well) from the H. Smith Richardson Golf Course Clubhouse Facility Site located in Fairfield, Connecticut. The remediation activities shall comply with all aspects of the contract documents and federal, state and local requirements.

B. Whenever there is a conflict or overlap within these specifications and between applicable codes and regulations, the most stringent provision specified shall apply.

C. The General Contractor or Remediation Subcontractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the General Contractor or Remediation Subcontractor of its obligation to furnish all labor and materials necessary to perform the Work.

D. Work outlined in this Section includes all work necessary for the complete removal and disposal of all PCB-Containing Materials impacted by the proposed work associated with the demolition project for the H. Smith Richardson Golf Course Clubhouse Facility Site located in Fairfield, Connecticut.

E. Note the work in this section is not subject to TSCA regulation 40 CFR 761, but is subject to compliance with Connecticut General Statutes in accordance with CT DEEP requirements for materials containing >1 to <50 ppm PCBs (PCB-Containing Materials). The Owner or the Owner's Authorized Representative is responsible for notifying the CT DEEP. The work is being performed however in conjunction with work complying with TSCA regulation 40 CFR 761.

F. The quantities given below are provided to establish the order of magnitude of the remediation project. Actual quantities may vary. The PCB Remediation Contractor is responsible for verification of all quantities scheduled for removal. This verification shall include an on-site walk-through inspection of the building. The materials/quantities listed are “all existing systems” and no extra will be accepted.

1. Location and materials included in the base bid are noted below.

G. The scope of work is summarized as the following:

1. PCB Sealant Bulk Sampling Analytical Results Summary
   The following materials and approximate quantities were found to contain PCBs above the CT DEEP threshold of >1 ppm PCB source material (< 50 ppm PCB – EPA Threshold):
a. interior and exterior source window caulking/sealant compounds throughout the main building – assume multiple layers of caulking/sealants, accessible and inaccessible and all adjacent substrates contaminated (estimate 20 openings of varying sizes - asbestos containing as well).

2. Adjacent Building Materials Sampling Analytical Results Summary
   Adjacent building materials samples were not collected since no source materials were found to contain PCB >50 ppm.

3. PCB Materials Removal and Disposal Summary
   Based on the results of the interior and exterior window caulking/sealant compounds (including contaminated substrates) (asbestos containing as well) throughout the main building can be removed, managed, and disposed (i.e., removal under proper controls to minimize potential contaminant spread, and waste profiled accordingly to a facility that can accept this waste), as > 1 ppm and < 49 ppm PCB waste and asbestos, in accordance with CT DEEP regulations.

H. Project Scope Locations and Work Statement: The remediation site is the located at 2425 Morehouse Highway, Fairfield, Connecticut. Locations of work are also detailed on Drawing HBM-01. The proposed removal and disposal activities to be performed by PCB Remediation Contractor shall include the following:

1. Site preparation and controls to facilitate remediation of PCBs. Containment procedures referenced for the remediation zone must be utilized for PCB CT DEEP regulated removal and disposal.

2. Health and Safety in accordance with Occupation Safety and Health Administration (OSHA) requirements.
   Remove and dispose of entire/all interior/exterior window system caulking/sealant compounds (all layers and includes contaminated substrates) throughout the main building.
   All exterior protection shall include the use of water impervious membrane covering which shall be secured to the ground surface. Edges shall be raised to prevent water run-off used for dust control during cutting and demolition of structures. Plywood will be installed on all exterior ground surfaces first. The exterior membrane shall be covered with a minimum of 2 layers of 10-mil reinforced polyethylene sheeting securely fastened to foundation. This ground protection must extend at least 20 feet away from the building foundation.

I. The General Contractor, or Remediation Subcontractor, is responsible for conducting all work involving the removal, management, storage, and disposal of PCB waste materials in accordance with this specification, with all referenced documents included as part of this specification, with the standards and guidance documents listed below, and with all federal, state and local regulations.

J. The General Contractor or Remediation Subcontractor shall provide all labor, materials, and equipment necessary to complete the work of this Section.
K. The general/remediation contractors shall only use heavy equipment operators that have proper asbestos and/or HAZWOPER training when disturbing/removing/moving and packing asbestos, lead and PCB containing materials. Acceptable training for asbestos can be 32/40 hour asbestos worker/supervisor training with annual refresher training. 40 hour HAZWOPER training and annual refresher training is required for operators handling lead and/or PCB containing/contaminated materials. All operators must also have current medicals, fit test data and wear respirators during work. Respirator usage can be suspended if personal air sampling shows appropriate air concentrations complying with OSHA for asbestos containing materials.

1.9 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where a conflict or overlap among regulations and/or these specifications exist, the most stringent requirements shall apply.

1. American National Standards Institute (ANSI)
   a. ANSI.Z89.1 Personnel Protective Equipment - Protective Headwear for Industrial Worker's Requirements (Latest Revision)
   b. ANSI.Z87

2. Code of Federal Regulations (CFR)
   a. 29 CFR Subpart D- Walking, Working Surfaces
   c. 29 CFR 1910.134 - Respiratory Protection Standard
   d. 29 CFR 191 0.146 - Permit-Required Confined Spaces
   e. 29 CFR 1910.1000 — Air Contaminants (Table Z-1)
   g. 29 CFR 1926.20 - General Health and Safety Provisions
   h. 29 CFR 1926.57 - Ventilation

3. 29 CFR 1926.59 - Hazard Communication Program
   a. 29 CFR 1926.62 - Lead Exposure in Construction
   b. 29 CFR 1926.95 - Criteria for Personal Protective Equipment

4. 29 CFR 1926, Subpart H - Materials Handling, Storage, Use and Disposal
   a. 29 CFR 1926, Subpart L - Scaffolding
   b. 29 CFR 1926, Subpart M - Fall Protection
   c. 29 CFR 1926, Subpart X – Ladders

5. 29 CFR 1926, Subpart Z - Toxic and Hazardous Substances
   a. 40 CFR 50.6 - National Primary and Secondary Ambient Air Quality Standards for Particulate Matter
   c. 40 CFR 261 - Identification and Listing of Hazardous Waste
   d. 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste
e. 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste

6. 40 CFR 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
   a. 40 CFR 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

7. 40 CFR 268 - Land Disposal Restrictions
   a. 40 CFR 700 - Toxic Substances Control Act (TSCA)
   b. 40 CFR 761 - PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

8. 49 CFR 105 - Hazardous Materials Program Definitions and General Procedures
9. 49 CFR 171 - General Information, Regulations and Definitions
10. 49 CFR 172 - Hazardous Material Table, Special Provisions,
12. 49 CFR 173 - Shippers-General Requirements for Shipments and Packaging
13. 49 CFR 177 - Carriage by Public Highway
14. 49 CFR 176 - Specifications for Packaging
15. National Institute for Occupational Safety and Health (NIOSH)
   a. Publication Number 87-106 Respiratory Decision Logic
   b. NIOSH/OSHA Booklet 3142 Lead in Construction

16. U.S. Environmental Protection Agency (USEPA), Toxic Substances Control Act (TSCA)
   a. Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act
   b. 40 CFR Part 761.50 - Applicability (b) (1-8)
   c. 40 CFR Part 761.61 - PCB Remediation Waste
   d. 40 CFR Part 761.62 - PCB Bulk Product Waste
   e. 40 CFR Part 761.79 – Decontamination

17. Center for Disease Control (CDC): Air Pollution and Respiratory Health.

1.10 DEFINITIONS

A. The following definitions as used within this technical specification as well as references to specific sections of the Code of Federal Regulation section 40 CFR Part 761 are provided. Definitions are extracted in part from 40 CFR Part 761.3; for full definitions refer to the specified section of the regulations:

2. **Containment** means the enclosure within the building which establishes a contaminated area and surrounds the location where PCB and/or other toxic or hazardous substance removal is taking place and establishes a Control Work Area.

3. **Designated Facility** means the off-site disposer or commercial storer of PCB-containing waste designated on the manifest as the facility that will receive a manifested shipment of PCB containing waste.

4. **Disposal** means intentionally or accidentally to discard, throw away, or otherwise complete or terminate the useful life of PCBs and PCB items; Disposal includes spills, leaks, and other uncontrolled discharges of PCBs as well as actions related to containing, transporting, destroying, degrading, decontaminating, or confining PCBs and PCB items.

5. **DOT** means the United States Department of Transportation.

6. **Excluded PCB Products** means PCB materials which appear at concentrations less than 50 ppm as defined in 40 CFR §761.3.

7. **Fixed Object** means mechanical equipment, electrical equipment, fire detection systems, alarms, and all other fixed equipment, fixtures, or other items which cannot be removed from the work area.

8. **Generator of PCB Waste** means any person whose act or process produces PCBs that are regulated for disposal under subpart D of 40 CFR Part 761, or whose act first causes PCBs or PCB Items to become subject to the disposal requirements of subpart D, or who has physical control over the PCBs when a decision is made that the use of the PCBs has been terminated and therefore is subject to the disposal requirements of subpart D. Unless another provision of 40 CFR Part 761 specifically requires a site-specific meaning, "generator of PCB waste" includes all of the sites of PCB waste generation owned or operated by the person who generates PCB waste.

9. **HEPA** means High Efficiency Particulate Air filtration efficiency of 99.97 percent down to 0.3 microns. Filtration provided on specialized vacuums and air filtration devices to trap particles.

10. **Incinerator** means an engineered device using controlled flame combustion to thermally degrade PCBs and PCB Items. Examples of devices used for incineration include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers.

11. **Laboratory** means a facility that analyzes samples for PCBs and is unaffiliated with any entity whose activities involve PCBs.

12. **Large PCB Mark—M_L Mark** means M_L shall include letters and striping on a white or yellow background and shall be sufficiently durable to equal or exceed the life (including storage for disposal) of the PCB Article, PCB Equipment, or PCB Container. The size of the mark shall be at least 15.25 cm (6 inches) on each side. If the PCB Article or PCB Equipment is too small to accommodate this size, the mark may be reduced in size proportionately down to a minimum of 5 cm (2 inches) on each side.

13. **Liquid PCBs** means a homogenous flowable material containing PCBs and no more than 0.5 percent by weight non-dissolved material.

14. **Manifest** means the shipping document EPA form 8700-22 and any continuation sheet attached to EPA form 8700-22, originated and signed by the generator of PCB containing waste.

15. **Mark** means the descriptive name, instructions, cautions, or other information applied to PCBs and PCB Items, or other objects.

16. **Marked** means the marking of PCB Items and PCB storage areas and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the requirements of the regulations.

17. **Municipal Solid Wastes** means garbage, refuse, sludges, wastes, and other discarded materials resulting from residential and non-industrial operations and activities, such as household activities, office functions, and commercial housekeeping wastes.
18. **Non-liquid PCBs** means materials containing PCBs that by visual inspection do not flow at room temperature (25°C or 77°F) or from which no liquid passes when a 100 g or 100 ml representative sample is placed in a mesh number 60 ±5 percent paint filter and allowed to drain at room temperature for 5 minutes.

19. **Non-porous Surface** means a smooth, unpainted solid surface that limits penetration of liquid containing PCBs beyond the immediate surface. Examples are: smooth un-corroded metal; natural gas pipe with a thin porous coating originally applied to inhibit corrosion; smooth glass; smooth glazed ceramics; impermeable polished building stone such as marble or granite; and high density plastics, such as polycarbonates and melamines that do not absorb organic solvents.

20. **On-site** means within the boundaries of a contiguous property unit.

21. **PCB and PCBs** means any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. Refer to §761.1(b) for applicable concentrations of PCBs. PCB and PCBs as contained in PCB items are defined in §761.3. PCB Article means any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes and any other manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have no commercial purpose separate from that of the PCB Article.

22. **PCB Article Container** means any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.

23. **PCB Bulk Product Waste** means waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal is >50 ppm PCBs. PCB bulk product waste does not include PCBs or PCB Items regulated for disposal under §761.60(a) through (c), §761.61, §761.63, or §761.64. PCB bulk product waste is further defined in 40 CFR §761.3. Note in accordance with October 2012 reinterpretation from the U.S. Environmental Protection Agency (EPA), adjacent porous materials in contact with PCB Bulk Products shall be considered PCB Bulk Product Material for disposal purposes.

24. **PCB Capacitor** means any capacitor that contains >500 ppm PCB. Concentration assumptions applicable to capacitors appear under §761.2.

25. **PCB Container** means any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs.

26. **PCB — Containing Materials** for purposes of this section means those materials containing <50 ppm which have been documented as Excluded PCB Products and therefore not subject to the requirements of EPA regulation 40 CFR part 761, but include CT DEEP regulated concentrations of PCBs requiring proper removal and disposal in accordance with this section.

27. **PCB Equipment** means any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

28. **PCB Item** means any PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCBs or PCBs.

29. **PCB Wastes** means those PCBs and PCB Items that are subject to the disposal requirements of subpart D in 40 CFR Part 761.
30. **Porous Surface** means any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with a porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low-density plastics such as Styrofoam and low-density polyethylene; coated (varnished or painted) or uncoated wood; concrete or cement; plaster; plasterboard; wallboard; rubber; fiberboard; chipboard; asphalt; or tar paper. For purposes of cleaning and disposing of PCB remediation waste, porous surfaces have different requirements than non-porous surfaces.


32. **Standard Wipe Sample** means a sample collected for chemical extraction and analysis using the standard wipe test as defined in §761.123. Except as designated elsewhere in part 761, the minimum surface area to be sampled shall be 100 cm².

33. **Storage for Disposal** means temporary storage of PCBs that have been designated for disposal.

34. **SW-846** means the document having the title "SW-846, Test Methods for Evaluating Solid Waste."

35. **Totally Enclosed Manner** means any manner that will ensure no exposure of human beings or the environment to any concentration of PCBs.

36. **Transfer Facility** means any transportation-related facility including loading docks, parking areas, and other similar areas where shipments of PCB waste are held during the normal course of transportation. Transport vehicles are not transfer facilities under this definition, unless they are used for the storage of PCB waste, rather than for actual transport activities. Storage areas for PCB waste at transfer facilities are subject to the storage facility standards of §761.65, but such storage areas are exempt from the approval requirements of §761.65(d) and the recordkeeping requirements of §761.180, unless the same PCB waste is stored there for a period of more than 10 consecutive days between destinations.

37. **Transporter of PCB Waste** means for the purposes of subpart K of 40 CFR Part 761, any person engaged in the transportation of regulated PCB waste by air, rail, highway, or water for purposes other than consolidation by a generator.

38. **Transport Vehicle** means a motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.


### 1.11 SUBMITTALS

**A.** A pre-remediation meeting shall occur with the PCB Remediation Contractor, Owner or the Owner's Authorized Representative, and environmental consultant two weeks prior to commencement of work. The following documents shall be submitted immediately upon project award to the Owner prior to commencement of PCB Removal work:

1. Site Specific Health and Safety Plan (HASP): The PCB Remediation Contractor shall prepare a site specific HASP plan for protection of workers and control of the work site in accordance with OSHA regulatory requirements. The HASP shall govern all work conducted at the Site during the removal of PCB-Containing Materials and related debris; waste handling, sampling, waste management; and waste transportation. At a minimum, the HASP shall address the requirements set forth in 29 CFR 1910.120, as further outlined below:
   
   a. Health and Safety Organization
   b. Site Description and Hazard Assessment
c. Training
d. Medical Surveillance
e. Work Areas
f. Personal Protective Equipment
g. Personal Hygiene and Decontamination
h. Standard Operating Procedures and Engineering Controls

2. Emergency Equipment and First Aid Provisions
   a. Equipment Decontamination
   b. Air Monitoring
c. Telephone List
d. Emergency Response and Evacuation Procedures and Routes
e. Site Control
f. Permit-Required Confined Space Procedures
g. Spill prevention and Containment Plan
h. Heat and Cold Stress
i. Record Keeping
j. Community Protection Plan

3. Training Documentation: Documentation of OSHA 40-Hour HAZWOPER Training for all employees and subcontractors to be used for the removal work, and 8-Hour HAZWOPER Supervisor Training for the designated on-site Health and Safety Officer for the remediation work.

4. PCB and or other Toxic or Hazardous Substances Disposal Plan: A written plan that details the PCB Remediation Contractor's plan for transportation and disposal of PCB-Containing Materials or other Toxic or Hazardous Substance wastes generated during the project. The Disposal Plan shall identify:
   a. Waste packaging, labeling, placarding, and manifesting procedures.
   b. The name, address, and 24-hour contact number for the proposed treatment or disposal facility or facilities to which waste generated during the project will be transported.
   c. The name, address, contact person(s) and state-specific permit numbers for proposed waste transporters, and US EPA and DOT identification number for firms that will transport PCB-Containing Material waste.
   d. The license plate numbers of vehicles to be used in transporting of the waste from the Site to the disposal facility.
   e. The route(s) by which the waste will be transported to the designated disposal facility, and states or territories through which the waste will pass.

5. Safety Data Sheets: Safety Data Sheets (OSHA Form 174 or equivalent) and manufacturer's information shall be provided for all chemicals and materials to be used during the project including but not limited to specialty cleaners and chemical stripping products.

B. The following documents shall be submitted to the Owner within fifteen (15) work days following removal of waste from the Site:
   1. Waste Profile Sheets
   2. Pre-Disposal Analysis Test Results (If required by disposal facility)
   3. Manifests signed by the disposal facility
   4. Tipping Receipts provided by the disposal facility
5. Certification of Final Treatment/Disposal signed by the responsible disposal facility official.

C. PCB Removal Work Closeout Submittals:

1. Disposal Site Receipts: Copy of waste shipment record and disposal site receipt showing that PCB-Containing Materials or other Toxic or Hazardous Substances materials have been properly disposed.

D. Product Data: Catalog sheets, specifications, and application instructions for any removal products, if used.

1.12 REGULATIONS AND STANDARDS

A. The PCB Remediation Contractor shall be solely responsible for conducting this project and supervising all work in a manner that will be in conformance with all federal, state, and local regulations and guidelines pertaining to PCB-Containing Material removal. Specifically, The PCB Remediation Contractor shall comply with the requirements of the following as applicable to the work to be performed:

1. Toxic Substance Control Act (TSCA) (40 CFR Part 761).
3. Department of Transportation (DOT) regulations - DOT regulation HM-181 regulates transportation of hazardous materials, including PCBs.
4. Occupational Safety and Health Administration (OSHA) - OSHA regulates workers' safety and exposure to a variety of chemicals including PCBs.
5. Connecticut Basic Building Code (BOCA) (including Connecticut Supplements);
6. Life Safety Code (NFPA); and
7. Local health and safety codes, ordinances or regulations pertaining to hazardous materials remediation and all national codes and standards including ASTM, ANSI, and Underwriter's Laboratories.

1.13 FINAL VISUAL CLEARANCE

A. Following the completion of the work, the Consultant shall perform a final visual inspection of the work area per guidelines and State of Connecticut CT DEEP regulations to assess that the above-indicated PCB-containing materials were removed.

1.14 POSTING AND RECORD MAINTENANCE REQUIREMENTS

A. The following items shall be conspicuously displayed proximate but outside of removal work areas.

1. Exit Routes -Emergency exit procedures and routes
2. Emergency Phone Numbers - A list indicating the telephone numbers and locations of the local hospital(s); the local emergency squad; the local fire department; the local police department; the Poison Control Center; Chemical Emergency Advise (CHEMTREC); the local Department of Health's local office; the PCB Remediation Contractor (on-site and after hours numbers); and the environmental consultant (on-site and after hours numbers).
3. Warning Signs - Warning signs shall be in English and the language of any workers on-site who do not speak English, and be of sufficient size to be clearly legible and display the following or similar language in accordance with 29 CFR 1910.1200:

   WARNING
   HAZARDOUS WASTE WORK AREA
   PCBs-POISON
   NO SMOKING, EATING OR DRINKING
   AUTHORIZED PERSONNEL ONLY
   PROTECTIVE CLOTHING IS REQUIRED IN THIS AREA

4. In addition, all entrances to work areas shall be posted with a PCB M large marker.

   B. The PCB Remediation Contractor shall maintain the following items on-site and available for review by all employees and authorized visitors:

      1. Contractor's Project Specific Health and Safety Plan
      2. Certificates of Training for all employees and the project Supervisor
      3. Codes, Standards and Publications
      4. Safety Data Sheets (SDS) for all chemicals used during the project.
      5. Copies of The PCB Remediation Contractor's written hazard communication, respiratory protection, and confined space entry programs.

   C. Fees, Permits, and Licenses. The PCB Remediation Contractor shall pay all licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing in the performance of the work specified in this Section.

      1. The PCB Remediation Contractor shall be solely responsible for costs, damages, or losses resulting from any infringement of these patent rights or copyrights. The PCB Remediation Contractor shall hold the Owner and the Owner's Authorized Representative harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights.
      2. The PCB Remediation Contractor shall be responsible for securing all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

   1.15 QUALITY ASSURANCE

   A. The PCB Remediation Contractor shall provide and assure that the quality of work practices and procedures to be utilized are consistent with the above listed agencies and regulations. PCB Remediation Contractor shall utilize the latest edition, including all addenda, revisions and supplements for all regulatory agencies codes, etc.

   B. Worker's Qualifications: The persons performing PCB remediation and their supervisors shall be personally experienced in PCB remediation work and shall have been regularly employed by a company performing PCB remediation for a minimum of 3 years.

   C. Pre-Work Conference: Before the Work of this Section is scheduled to commence, a conference will be held by the Owner at the Site for the purpose of reviewing the Contract Documents, discussing requirements for the Work, and reviewing the Work procedures.
1. The conference shall be attended by the PCB Remediation Contractor, and the Owner's Authorized Representative employed by the Owner. This pre-remediation meeting may consist of multiple meetings.

1.16 MINIMUM REQUIREMENTS FOR WORKER HEALTH AND SAFETY

A. The PCB Remediation Contractor is responsible and liable for the health and safety of all on-site personnel and the off-site community affected by the project. All on-site workers or other persons entering the remediation work areas, decontamination areas or waste handling and staging areas shall be knowledgeable of and comply with the requirements of the site specific Health and Safety Plan at all times. The PCB Remediation Contractor's HASP shall comply with all applicable federal, state, and local regulations protecting human health and the environment from the hazards posed by the work to be performed under this project.

B. Consistent disregard for the provisions of the HASP shall be deemed as sufficient cause for immediate stoppage of work and termination of the Contract or any Sub Contracts without compromise or prejudice to the rights of the Owner or the Owner's Authorized Representative.

C. Any discrepancies between the PCB Remediation Contractor's HASP and these specifications or federal and state regulations shall be resolved in favor of the more stringent requirements that provide the highest degree of protection to the project personnel and the surrounding community and environment.

D. In addition to exposure concerns relating to the presence of PCBs, other health and safety considerations will apply to the work. The PCB Remediation Contractor shall be responsible for recognizing such hazards and shall be responsible for the health and safety of Contractor employees at all times. It is the PCB Remediation Contractor's responsibility to comply with all applicable health and safety regulations.

E. The HASP shall be reviewed by all persons prior to entry into the remediation, decontamination, or waste staging areas, whether a representative of the PCB Remediation Contractor, owner, architect/engineer, environmental consultant, subcontractor(s), waste transporter or federal, state or local regulatory agency. Such review shall be acknowledged and documented by the PCB Remediation Contractor's Health and Safety Officer by obtaining the name, signature, and affiliation of all persons reviewing the HASP.

F. The HASP shall be maintained so as to be readily accessible and reviewable by all site personnel throughout the duration of the remediation project and until all waste materials are removed from the Site and disposed of at the appropriate disposal facility.

G. The PCB Remediation Contractor's on-site Health and Safety Officer shall be responsible for ensuring that project personnel and site visitors are informed of and comply with the provisions of the HASP at all times during the project.

1.17 WORK AREAS AND ZONES

A. The PCB Remediation Contractor shall lay-out and clearly identify work areas in the field. Access by equipment, site personnel, and the public to the work areas shall be limited as follows:

1. Remediation Zone: The Remediation Zone(s) shall consist of all areas where removal of PCB-Containing Materials and other Toxic or Hazardous Substances and waste handling
and staging activities are on-going and the immediately surrounding locale or other areas where contamination could occur. Each Remediation Zone for purposes of removal of PCB-Containing Materials or other Toxic or Hazardous Substances for disposal shall be performed within a regulated area (refer to section 3.1 and 3.2) to isolate work areas from non-work areas. The regulated area shall be visibly delineated with appropriate warning signs at all approaches to Remediation (including a large PCB Marker), and be restricted from access by all persons except those directly necessary for the completion of the respective remediation tasks. The Remediation Zones shall be relocated and delineated as necessary as work progresses from one portion of the project site to another, to limit access to each remediation area and to minimize risk of exposure to site workers and the general public. Access shall be controlled at the periphery of the Remediation Zones to regulate the flow of personnel and equipment into and out of each zone and to help verify that proper procedures for entering and exiting are followed. All persons within the Remediation Zones shall wear the appropriate level of protection established in the HASP.

2. **Decontamination Zone:** The Decontamination Zone is the transition zone between the remediation area and the clean support zone of the project site, and is intended to reduce the potential for contaminants from being dispersed from the Remediation Zone to clean areas of the Site. The Decontamination Zone shall consist of a buffer area surrounding each Remediation Zone through which the transfer of equipment, materials, personnel and containerized waste products will occur and in which decontamination of equipment, personnel, and clothing will occur. The Decontamination Zones shall be constructed as a remote three chamber decontamination unit for workers and a two chamber equipment room for waste load out as detailed in Section 3.3. All emergency response and first aid equipment shall be readily maintained in these Zones. All protective equipment and clothing shall be removed or decontaminated in the Decontamination Zone prior to exiting to the Support Zone.

3. **Support Zone:** The Support Zone will consist of the area outside the Decontamination Zones and the remainder of the project site. Administrative and other support functions and any activities that by nature need not be conducted in the Remediation or Decontamination Zone related to the project shall occur in the Support Zone. Access to the Remediation and Decontamination Zones shall be controlled by the Health and Safety Officer and limited to those persons necessary to complete the remediation work and which have reviewed and signed the HASP.

### 1.18 PERSONNEL PROTECTIVE EQUIPMENT

A. The PCB Remediation Contractor shall be responsible to determine and provide the appropriate level of personal protective equipment in accordance with applicable regulations and standards necessary to protect the PCB Remediation Contractor's employees from all hazards present.

B. The PCB Remediation Contractor shall provide all employees with the appropriate safety equipment and protective clothing to ensure an appropriate level of protection for each task, taking into consideration the chemical, physical, ergonomic and biological hazards posed by the Site and work activities.

C. The PCB Remediation Contractor shall establish in the HASP criteria for the selection and use of personal protective equipment (PPE). All personnel must utilize proper Personal Protective Equipment (PPE) during all work activities. Proper PPE may vary depending on the job task, but may include disposable gloves, disposable rubber boots, steel-toe boots, Tyvek suits, respirators, hard hats, hearing protection, and/or eye protection.
D. The PPE to be utilized for the project shall be selected based upon the potential hazards associated with the project site and the work to be performed. Appropriate protective clothing shall be worn at all times within the Remediation Zone.

E. The PCB Remediation Contractor shall provide the appropriate level of respiratory protection to all field personnel engaged in activities where respiratory hazards exist or there is a potential for such hazard to exit.

F. The PCB Remediation Contractor shall provide, as necessary, protective coveralls, disposable gloves and other protective clothing for all personnel that will be actively involved in remediation activities or waste handling activities or otherwise present in the Remediation Zones. Coveralls shall be of Tyvek or equivalent material. Should the potential for exposure to liquids exist, splash resistant disposable suits shall be provided and utilized. Provide sufficient quantities of protective clothing to assure that enough complete disposable outfits are available for each individual performing remediation work each day.

G. Protective coveralls, and other protective clothing shall be donned and removed within the Decontamination Zone and shall be disposed of at the end of each day. Ripped coveralls shall be immediately replaced after appropriate decontamination has been completed to the satisfaction of the Health and Safety Officer. Protective clothing shall not be worn outside of the Decontamination Zone.

H. Hard Hats, protective eyewear, rubber boots and or other non-slip footwear shall be provided by the PCB Remediation Contractor as required for workers and authorized visitors.

I. All contaminated protective clothing, respirator cartridges and disposable protective items shall be placed into proper containers to be provided by the PCB Remediation Contractor for transport and proper disposal in accordance with 40 CFR 262.

1.19 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. The PCB Remediation Contractor shall provide and maintain at the Site, at a minimum, the following Emergency and First Aid Equipment:

1. Fire Extinguishers: A minimum one (1) fire extinguisher shall be supplied and maintained at the Site by the PCB Remediation Contractor throughout the duration of the project. Each extinguisher shall be a minimum of a 20 pound Class ABC dry fire extinguisher with Underwriters Laboratory approval per 29 CFR 1910.157.

2. First Aid Kit: A minimum one (1) first aid kit meeting the requirements of 29 CFR 1910.151 shall be supplied and maintained at the Site by the PCB Remediation Contractor throughout the duration of the project.

3. Communications: Telephone communications (either cellular or land line) shall be provided by The PCB Remediation Contractor for use by site personnel at all times during the project.

B. The Health and Safety Officer shall be notified immediately in the event of personal injury, potential exposure to contaminants, or other emergency. The Health and Safety Officer shall then immediately notify the Owner's Authorized Representative.

1.20 STANDARD SAFETY AND HEALTH PROCEDURES AND ENGINEERING CONTROLS
A. The following provisions shall be employed to promote overall safety, personnel hygiene and personnel decontamination:

1. Each Contractor or Subcontractor shall ensure that all safety equipment and protective clothing to be utilized by its personnel is maintained in a clean and readily accessible manner at the Site.
2. All prescription eyeglasses in use on this project shall be safety glasses conforming to ANSI Standard Z87.1. No contact lenses shall be allowed on the Site.
3. Prior to exiting the delineated Decontamination Zone(s), all personnel shall remove protective clothing, and place disposable items in appropriate disposal containers to be dedicated to that purpose. Following removal of PPE, personnel shall thoroughly wash and rinse their face, hands, arms and other exposed areas with soap and tap water wash and subsequent tap water rinse. A fresh supply of tap water shall be provided at the Site on each work day by the PCB Remediation Contractor for this purpose.
4. All PPE used on-site shall be decontaminated or disposed of at the end of each work day. Discarded PPE shall be placed in sealed DOT approved 55-gallon barrels for off-site disposal.
5. Respirators, if necessary due to an upgrade to Level C PPE, shall be dedicated to each employee, and not interchanged between workers without cleaning and sanitizing.
6. Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the likelihood of hand to mouth contact shall be prohibited within the delineated remediation and decontamination work zones. Prior to performing these activities, each employee shall thoroughly cleanse their face, hands, arms and other exposed areas.
7. All personnel shall thoroughly cleanse their face, hands, arms and other exposed areas prior to using toilet facilities.
8. No alcohol, tobacco, illicit drugs or firearms will be allowed on the Site at any time.
9. Contact with potentially contaminated surfaces should be avoided, if possible. Field personnel should minimize walking through standing water/puddles, mud or other wet or discolored surfaces; kneeling on ground; and placing equipment, materials or food on ground or other potentially contaminated surface.
10. The use of the "Buddy System shall be employed at all times while conducting work at the Site. Each employee shall frequently monitor other workers for signs of heat stress or chemical exposure or fatigue: periodically examine others PPE for signs of wear or damage; routinely communicate with others; and notify the Health and Safety Officer in the case of an emergency.

B. Workers must wear protective suits, protective gloves, eye protection and a minimum of half-face respirator with HEPA filter cartridge for all projects. Respiratory protection shall be in accordance with OSHA regulation 1910.134 and ANSI Z88.2.

C. Workers must be trained as per OSHA and USEPA requirements, have medical clearance and must have recently received pulmonary function test (PFT) and respirator fit tested by a trained professional.

1. A personal air sampling program shall be in place as required by OSHA.
2. The use of respirators must also follow a complete respiratory protection program as specified by OSHA.
1.21 INDEPENDENT INSPECTION AND MONITORING

A. This section describes independent visual inspection and monitoring work being performed on behalf of the Owner. This work is not in the Contract Sum. This section describes monitoring carried out by the Owner's Consultant (Langan) to verify that the building beyond the work area and the outside environment remains uncontaminated.

B. The purpose of the Owner's Consultant's monitoring is to detect faults in the work area isolation such as:

1. Contamination of the building outside of the work area by PCB dust.
2. Failure of filtration or rupture in the differential pressure system as applicable.
3. Contamination of the outside of the containment.

C. Should any of the above occur, the PCB Remediation Contractor shall immediately cease removal activities until the fault is corrected. Do not recommence work until authorized by the Owner's Consultant.

D. The Owner's Consultant may monitor the Work Area. The purpose of this monitoring will be to detect dust outside containment, which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination.

E. The Owner's Consultant will perform on-site monitoring throughout the course of the project, as follows:

1. All work procedures shall be continuously monitored by the Consultant to assure that areas outside the designated work locations in the buildings will not be contaminated.
2. Prior to work on any given day, The PCB Remediation Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination of the building or the employees.

PART 2 - MATERIALS

2.1 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with PCBs shall be decontaminated or disposed of as PCB waste.

C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to the job site with factory label indicating:

1. Type: Minimum 2 layers of 6 mil., opaque, fire retardant polyethylene sheets.
D. Respirators:

   1. Type: Approved by the Mine Safety and Health Administration (MSHA), Department of Labor, or the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

      a. Polyethylene disposable bags shall be six (6) mil with pertinent pre-printed label. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.

      b. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

E. Cleaning Products: Contractor shall at their discretion utilize specialty cleaning products such as Capsur, TechXtract or other cleaners for use in decontaminating porous and nonporous surfaces to remain. All such products shall be utilized in accordance with manufacturer’s specifications as intended. PCB Remediation Contractor shall ensure appropriate use and disposal associated with use in accordance with the SDS sheets for each product utilized. It shall be incumbent upon the PCB Remediation Contractor to determine the need for use of specialty products to meet required cleaning verification levels established herein.

   1. The PCB Remediation Contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with PCBs.

   2. HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where PCB-containing materials may be disturbed.

2.2 TOOLS AND EQUIPMENT

   A. The PCB Remediation Contractor shall provide a sufficient supply of disposable mops, rags, and sponges for work area cleaning and decontamination shall be available.

   B. The PCB Remediation Contractor shall provide a sufficient supply of scaffolding, ladders, lifts, and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed.

   C. The PCB Remediation Contractor shall provide all tools and equipment necessary for PCB removal.

   D. The PCB Remediation Contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements.

   E. The PCB Remediation Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape and air filters.

   F. The PCB Remediation Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and electrical power sources (such as generators). Any electrical
connection work affecting the building electrical power system shall be performed by a State of Connecticut licensed electrician.

G. The PCB Remediation Contractor shall have available shower stalls and plumbing to support same to include sufficient hose length and drain system or an acceptable alternate.

H. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of -0.02 inches of water within enclosure with respect to outside area. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four (4) air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside.

I. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

2.3 PERSONNEL PROTECTION

A. Safety equipment (e.g., hard hats meeting the requirements of ANSI Standard 289.11981, eye protection meeting the requirements of ANSI Standard Z87.1-1979, safety shoes meeting the requirements of ANSI Standard Z41.1-1967, disposable PVC gloves or other work gloves), shall be provided to all workers and authorized visitors.

B. Non-slip footwear shall be provided to all remediation workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.

PART 3 - EXECUTION

3.1 AREA PROTECTION – REMEDIATION AREA

A. Protection of Existing Construction: Perform PCB-Containing Materials removal work without damage or contamination of adjacent areas, soil, and existing construction.

B. Prior to commencement of PCB removal activities at each work area, a regulated area shall be constructed by the PCB Remediation Contractor to capture and contain all materials removed during the remediation. Regulated area procedures referenced for the remediation zone must be utilized for PCB-Containing Materials removal.

C. During all removal activities, the PCB Remediation Contractor shall maintain control of all entrances and exits to the project site to ensure only authorized personnel enter the work areas and are afforded proper personal protective equipment and as required respiratory protection. All approaches to work areas shall be demarcated with appropriately worded warning signs.

D. Work zones shall be established in accordance with this section to include remediation one, decontamination zone and support zone.

E. Negative pressure containments shall be constructed consisting of two layers of 6-mil polyethylene sheeting on wall surfaces and two layers of 10-mil polyethylene sheeting on floor surfaces if required (fire retardant).
F. All openings such as unit ventilation, ducts, grilles, lights, doorways, and windows shall be securely sealed with a single layer of 6-mil polyethylene sheeting.

G. Containments shall remain in place throughout work to collect dust and debris resulting from PCB removal. All debris generated during operations including but not limited to visible building materials, dust, and debris shall be HEPA vacuumed continuously throughout the work shift and at the end of a work shift to avoid accumulation. Any tears or rips that occur in protections shall be repaired or removed and replaced with new protections.

H. Warning Signage: Post warning signs in accordance with 29 CFR 1910.1200 at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read signs and take precautionary measures to avoid exposure to PCBs or other Toxic or Hazardous Substances. These signs should include the large PCB MI, markers at each entrance to the work area.

I. Waste Containers for PCB-Containing Materials: Appropriate PCB waste containers shall be placed adjacent to remediation zones. Containers shall be lined covered and secured. The PCB waste containers shall be properly marked as described in 40 CFR part 761.40 and 45. Marking shall include a large PCB M, marker.

3.2 DECONTAMINATION SYSTEM

A. The PCB Remediation Contractor shall establish contiguous to the work area, a decontamination enclosure consisting of equipment room, shower room, and clean room in series. The only access between contaminated and uncontaminated areas shall be through this decontamination enclosure. If it is not feasible to set-up a contiguous decontamination unit, The PCB Remediation Contractor shall establish a remote decontamination unit.

B. Access between rooms in the decontamination system shall be through double flap curtain openings. The clean room, shower and equipment room within the decontamination enclosure, shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.

C. The PCB Remediation Contractor shall establish contiguous with the work area an equipment decontamination enclosure consisting of two (2) totally enclosed chambers divided by double flap curtained opening. This enclosure must be constructed so as to ensure no personnel enter or exit through this unit.

D. Occupied areas and/or building space not within the work areas shall be separated from PCB remediation work areas by means of airtight barriers.

E. Construct the decontamination system with wood or metal framing, 3/8” sheathing and cover both sides with a double layer of six (6) mil polyethylene sheeting, spray glued or taped at the joints. Caulk joints must be watertight at floor, walls, and ceiling.

F. The PCB Remediation Contractor and the Consultant shall visually inspect the barrier several times daily to assure an effective seal and the PCB Remediation Contractor shall repair defects immediately.

3.3 PCB-CONTAINING MATERIAL REMOVAL — PCB <50 PPM
A. PCB-Containing Materials summarized above containing less than 50 ppm and are to be removed from specified locations for proper disposal.

B. Materials shall be removed in a manner which does not breakdown the materials into fine dust or powder to the extent feasible. Equipment and tools to be utilized shall include hand tools and mechanical equipment such as demolition hammers to remove materials from adjacent substrates. Mechanical removal equipment shall as appropriate be fitted with dust collection systems.

C. Any dry or brittle materials or other PCB waste containing PCB <50 ppm shall be removed with additional engineering controls such as use of a HEPA vacuum to remove accumulated dust or debris during removal.

D. Sequence of removal shall follow the following general requirements:
   1. Construction of a negative pressure containment area shall be performed.
   2. Removal of PCB containing materials using hand tools and/or mechanical equipment fitted with dust collection systems.
   3. Use a solvent as appropriate to completely remove all visible materials for disposal as PCB Waste <50 ppm and asbestos.
   4. Clean all surfaces of adjacent materials using appropriate cleaning products or solvents to completely remove all dust and debris.

E. Waste shall be immediately containerized in 6-mil polyethylene disposal bags then placed into steel 55-gallon DOT approved drums for disposal. Waste generated includes PCB <50 ppm. The waste shall be containerized in six-mil polyethylene bags or sheeting. Facilities proposed for disposal shall be permitted to accept waste with PCB <50 and 1 ppm. See also requirements for asbestos waste disposal in Section 02082.

F. The use of minimal quantities of water to moisten the generated dust prior to collection shall be utilized. Under no circumstances shall the PCB waste show evidence of free liquid water, pooling, or ponding within the waste stream. Any liquid used to wet the dust and debris to control fugitive emissions shall be properly containerized and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with 40 CFR Part §761.60 (a).

3.4 CLEANING AND DECONTAMINATION

A. The PCB Remediation Contractor shall be responsible for complete cleaning and decontamination of the Remediation Zone upon completion of work. The Remediation Zone will be required to meet proposed final visual inspection requirements.

B. The PCB Remediation Contractor shall utilize HEPA vacuum and wet cleaning products to remove all visible dust and debris from all surfaces within the work area. If specialty products are utilized The PCB Remediation Contractor shall utilize in accordance with manufacturer's specifications including any additional safety and disposal requirements for such use.

C. Cleaning of containment barriers shall be performed prior to removal leaving critical barriers at openings, decontamination units and negative air filtration devices in place until results of post verification sampling indicate acceptable limits. Cleaning shall be performed from ceiling to floors.
D. Any liquid used to wet the dust and debris to control fugitive emissions shall be collected and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with §761.60 (a).

E. All rags and other cleaning materials used to clean shall also be properly disposed as PCB Waste. All PCB Waste shall be stored for disposal in accordance with 40 CFR Part §761.61(a)(5)(v)(A). All waste containers shall be appropriately marked in accordance with 40 CFR Part §761.40 and §761.45.

F. Equipment to be utilized in connection with the removal of PCB Containing Materials including waste collection or that will or may come in direct contact with the site contaminants shall be decontaminated prior to leaving the Site to prevent migration of the contaminated residues from the project site. Decontamination shall be in accordance with 40 CFR Part §761.79 and Sub-part S procedures.

G. All non-disposable equipment and tools employed in the course of the project will be decontaminated at the conclusion of each work day through the following sequence:

1. Initial tap water rinse, to remove gross soil
2. Tap water and hexane or equivalent wash
3. Tap water rinse
4. Second tap water and hexane or equivalent wash
5. Second tap water rinse

H. The wash water and decontamination liquids shall be captured and containerized in DOT approved 55-gallon barrels for off-site disposal.

3.5 CONSULTANT'S RESPONSIBILITIES

A. The PCB Remediation Contractor may monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.

B. The Consultant's project monitor shall provide continual evaluation of the condition of the building during removal, using his/her best professional judgments in respect to the State of Connecticut Department of Energy and Environmental Protection guidelines.

3.6 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The Owner shall retain an industrial hygiene firm (Owner's Authorized Representative) to perform periodic inspections and sampling during the work. Site visits shall be scheduled based on the progress of the work and at critical time periods.

B. Consultant shall conduct inspections throughout the progress of the removal project. Inspections shall be conducted in order to document the progress of the removal work as well as the procedures and practices employed by the PCB Remediation Contractor.

C. The Consultant shall perform the following inspections during the course of remediation activities:

1. Pre-commencement Inspection. Pre-commencement inspections shall be performed at the time requested by the remediation Contractor. The Consultant shall be informed 12 hours
prior to the time the inspection is needed. If, during the course of the pre-commencement
inspection, deficiencies are found, the PCB Remediation Contractor shall perform the
necessary adjustments in order to obtain compliance.

2. Work Area Inspections. Work area inspections shall be conducted on a daily basis at the
discretion of the Consultant. During the course of the work inspections, the Consultant shall
observe the PCB Remediation Contractor's removal procedures, verify barrier integrity,
assess project progress, and inform the remediation Contractor of specific remedial
activities if deficiencies are noted.

3. Final Visual Inspection. The Consultant, upon the request of PCB Remediation Contractor,
shall conduct final visual inspection. The final visual inspection shall be conducted after
completion of the final cleaning procedures. The final visual inspection shall verify that all
PCB-Containing Material and residual debris have been removed from the work area. If,
during the course of the inspection, the Consultant identifies residual dust or debris, the
PCB Remediation Contractor shall comply with the request of the Consultant in order to
render the area "dust free".

3.7 MARKING OF WASTE CONTAINERS

A. All waste containers must be marked with the name of the waste contained; the date in which
the first material was placed in the vessel; and the last date at which addition of waste occurred. All
waste containers must be marked with a large PCB ML marker.

B. All waste containers containing PCB Waste and contaminated debris, containment system
components, used personnel protective equipment, personal and equipment wash water and
decontamination fluids, or other wastes generated during the remediation work shall be labeled
as follows:

DOT Class 9 UN3432 (solid)
Or UN2315 (liquid) PCB Waste
RQ
Waste for Disposal
Federal law prohibits improper disposal.
If found, contact the nearest police or public safety authority or the U.S. Environmental Protection
Agency.
Generator's Information:
Manifest Tracking No.:
Accumulation Start Date:
EPA ID No.:
EPA Waste No.:
Total Weight:
Container No.:
HANDLE WITH CARE!

In addition, these containers must be marked with a PCB ML marker.

C. Such marking must be durable, in English and printed on or affixed to the surface of the package
or on a label, tag or sign; displayed on a background of sharply contrasting color; un-obscured by
labels or attachments and located away from any other marking (such as advertising) that could
substantially reduce its effectiveness.

3.8 ON-SITE WASTE MANAGEMENT AND DISPOSAL OF SOLID HAZARDOUS WASTES
A. All solid waste material, containment system components, used personnel protective equipment, and other solid wastes generated during the work, shall be placed directly in appropriate waste receptacles immediately upon removal from its in-situ position. Suitable waste receptacles may consist of roll-off containers or DOT-approved 55-gallon barrels.

B. The PCB Remediation Contractor shall be responsible for all packaging, labeling, transport, disposal, and record-keeping associated with PCB or PCB contaminated waste in accordance with all federal, state, and local regulations.

C. The PCB Remediation Contractor shall ensure that the person transporting the waste holds a valid permit issued in accordance with appropriate federal, state, and local regulations.

D. The PCB Remediation Contractor shall provide to the transporter at the time of transfer appropriate shipping records or uniform waste manifests as required by the federal, state, and local regulations with a copy to the Owner and Owner's Authorized Representative.

E. The PCB Remediation Contractor shall maintain proper follow up procedures to assure that waste materials have been received by the designated waste site in a timely manner and in accordance with all federal, state, and local regulations.

F. The PCB Remediation Contractor shall assure that disposal of PCB Waste material is at a facility approved to accept such waste and shall provide a tracking/manifest form signed by the landfill's authorized representative.

G. If roll-off containers are to be utilized for containerization of the remediation wastes the following shall apply:

1. All roll-off containers or other similar vessels utilized shall be watertight and lined with 6-mil polyethylene sheeting or equivalent impermeable lining, and equipped with a secured and impermeable cover.

2. The impermeable cover shall remain securely in place at all times when material is not being actively placed in the vessels. The PCB Remediation Contractor shall be responsible for ensuring that the cover remains securely intact until the container is removed from the Site.

H. If 55-Gallon barrels are to be utilized for waste containerization, the barrels shall consists of suitable DOT-approved 55-gallon barrels that are watertight and free of corrosion, perforations, punctures, or other damage. All barrels shall be securely covered and sealed at the conclusion of each work day.

I. The waste containers shall remain staged at the Site with a secure impermeable cover in place until the materials are transported from the Site to be delivered to the designated disposal facility.

J. A waste roll-off and barrel staging area shall be designated prior to initiation of the remediation work, and approved by the Owner's Authorized Representative.

K. Materials containing <50 ppm will be transported to one of the following facilities:

1. A facility permitted, licensed, or registered by a State to manage municipal solid waste subject to part 40 CFR Part §761.258.
2. A facility permitted, licensed, or registered by a State to manage non-municipal non-hazardous waste subject to 40 CFR Part §761.257.5 through 257.30, as applicable.
3. A hazardous waste landfill permitted by EPA under section 3004 of RCRA, or by a State authorized under section 3006 of RCRA.
4. Waste manifests must show chain of custody. Provide required copies of the waste shipment records for wastes to the Owner as required.

L. Any PCB Liquid Water Waste shall be properly containerized and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with 40 CFR Part §761.60 (a).

M. Any chemicals, solvents or other products used during decontamination shall be properly containerized as PCB Liquid Waste. Waste must be properly decontaminated or disposed in accordance with 40 CFR Part §761.60 (a) or 40 CFR Part §761.79 (g). PCB Liquid Waste shall be transported by a licensed hauler and shipped for treatment or disposal. Provide required copies of the uniform waste manifests for hazardous wastes to the Owner, waste generation State and waste destination State as required.

N. All contaminated waste shall be carefully loaded on trucks or other appropriate vehicles for transport. Before and during transport, care shall be exercised to insure that no unauthorized persons have access to the material.

O. Transporters of the waste are prohibited from "back hauling" any freight after the disposition of the Owner's waste stream until decontamination of the vehicle and/or trailer is assured.

END OF SECTION 028433
NESHAP PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS SURVEY REPORT

for

H. Smith Richardson Golf Course
Clubhouse Facility
2425 Morehouse Highway
Fairfield, Connecticut 06824

Prepared For:
William Silver, AIA
Principal
Silver/Petrucelli + Associates
3190 Whitney Avenue
Building 2
Hamden, Connecticut 06518

Prepared By:
Langan CT, Inc.
555 Long Warf Drive
New Haven, CT 06511

Matthew A. Myers
Senior Project Manager

15 April 2019
140195502
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Appendix C PCB Analytical Laboratory Results and Chain-of-Custody
Appendix D Building Drawing
Appendix E Langan Certifications and Accreditations
### ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>US EPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>AHERA</td>
<td>Asbestos Hazard Emergency Response Act</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulation</td>
</tr>
<tr>
<td>NESHAP</td>
<td>National Standards for Hazardous Air Pollutants</td>
</tr>
<tr>
<td>HUD</td>
<td>Housing and Urban Development</td>
</tr>
<tr>
<td>CT DPH</td>
<td>Connecticut Department of Public Health</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
</tr>
<tr>
<td>PLM</td>
<td>Polarized Light Microscopy</td>
</tr>
<tr>
<td>TEM</td>
<td>Transmission Electron Microscopy</td>
</tr>
<tr>
<td>ACM</td>
<td>Asbestos-Containing Materials</td>
</tr>
<tr>
<td>LBP</td>
<td>Lead-Based Paint</td>
</tr>
<tr>
<td>PCB</td>
<td>Polychlorinated Biphenyls</td>
</tr>
<tr>
<td>SF</td>
<td>Square Feet</td>
</tr>
<tr>
<td>LF</td>
<td>Linear Feet</td>
</tr>
<tr>
<td>mg/cm²</td>
<td>Milligrams per square centimeter</td>
</tr>
<tr>
<td>XRF</td>
<td>X-ray Fluorescence</td>
</tr>
<tr>
<td>AAS</td>
<td>Atomic Absorption Spectrometry</td>
</tr>
<tr>
<td>TCLP</td>
<td>Toxicity Characteristic Leaching Procedure</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION

Langan CT, Inc. (Langan) prepared this NESHAP (National Emission Standards for Hazardous Air Pollutants) Pre-Demolition Hazardous Building Materials (HBM) Survey Report on behalf of Silver/Petrucelli + Associates and the Town of Fairfield to identify accessible hazardous building materials that may exist at the H. Smith Richardson Golf Course Clubhouse Facilities at 2425 Morehouse Highway, Fairfield, Connecticut. This survey included the main clubhouse, boiler room building, cart barn structure, adjacent storage shed and marshal/superintendent booth. The objectives of this survey are to identify the presence or absence of accessible asbestos-containing materials (ACM) and lead-based paint (LBP) so these materials can be properly quantified and assessed in support of proposed demolition of the buildings. In addition, Langan performed limited polychlorinated biphenyl (PCB) building source sampling which included the collection and analysis of exterior expansion joint caulking compounds, door caulking compounds, window caulking compounds, and interior paint. A visual assessment of universal waste items was also included in this survey.

Details pertaining to the building subject to this survey are summarized in the following table.

| Client Name:            | Silver/Petrucelli + Associates  
|                         | 3190 Whitney Avenue Building 2  
|                           | Hamden, CT 06518                |
| Professional’s project #:| 140195502                      |
| Consultant’s Project Manager: | Matthew A. Myers               |
| Phone No.:              | 203-562-5571                   |
| Email:                 | mmyers@langan.com              |
| Property Address:       | 2425 Morehouse Highway         |
| Bldgs. Gross Footage:  | Main Clubhouse: 7,400 SF      |
| No. of Buildings:       | Golf Cart Barn: 2,500 SF      |
| No. of Stories:         | Storage Shed: 300 SF          |
|                         | Marshal/Superintendent Booth: 60 SF |
| Property Use:           | Boiler Room: 90 SF            |
| Property Visit Date:    | 28 March 2019                 |
| Construction Dates:     | 1972                         |
|                         | One story                     |

The following sections summarize the findings for the building surveyed.
2.0 ASBESTOS-CONTAINING MATERIALS (ACM)

Terminology

Suspect Asbestos-Containing Materials

Asbestos was used in certain types of construction and building materials and currently can be found in new building products. Until a material is examined by using polarized light microscopy (PLM) or a similar technique, the building material is considered as a suspect asbestos-containing material. A few examples of these materials include wall and ceiling plasters, sheetrock and taping compound, flooring materials, ceiling panels, thermal system insulation, fireproofing insulation, roofing materials, adhesives, damp-proofing and waterproofing materials, caulking and glazing compounds, etc. Any suspect ACM and/or building material of unknown asbestos content should be assumed to be an asbestos containing material and handled and disposed of accordingly. Demolition, renovation, maintenance or daily activities should not disturb building materials that are found to contain asbestos, assumed to contain asbestos or that have not been tested for possible asbestos content.

Asbestos–Containing Material

A material with an asbestos concentration greater than 1% by weight is considered as ACM by the United States Environmental Protection Agency (US EPA) and State of Connecticut Department of Public Health (CT DPH). Thus, a material which contains asbestos in concentrations greater than 1% by weight is considered “positive” while a material that does not contain asbestos or asbestos is detected in concentrations equal to or less than 1% by weight is considered “negative”. However, for disposal purposes, materials that contain less than 1% asbestos may be required to be disposed of as an asbestos-containing/contaminated material (not common construction waste) depending upon the hauler and landfills requirements.

Regulatory Guidelines and Requirements

Federal

In accordance with the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) established National Emission Standards for hazardous Air Pollutants (NESHAP) to protect the public from exposure to airborne pollutants. Asbestos was one of the air pollutants, which was addressed under the NESHAP 40 CFR Part 61. The purpose of asbestos NESHAP regulations is to protect the public health by minimizing the release of asbestos when facilities, which contain ACM, are being renovated or demolished. EPA is responsible for enforcing regulations related to
asbestos during renovation and demolition activities, however, the CAA allows the EPA to delegate this authority to state and local agencies. Even after EPA delegates responsibility to a state or local agency, EPA retains the authority to oversee agency performance and to enforce NESHAP regulations as appropriate. OSHA considers any amount of asbestos to be regulated.

State

Asbestos in Connecticut is regulated by the State of Connecticut Department of Public Health (CT DPH), under Standards for Asbestos Abatement – Section 19a-333a-1 through 16 of Regulations of Connecticut State Agencies (RCSA) and Licensing and Training Requirements for Persons Engaged in Asbestos Abatement and Asbestos Consulting Services – Section 20-440-1 through 9 and Section 20-441 of RCSA.

Asbestos Survey

During this survey, suspect ACM were separated into three US EPA categories. These categories are: thermal system insulation (TSI), surfacing materials and miscellaneous materials. TSI includes all materials used to prevent heat gain or loss or water condensation on mechanical systems. Typical examples of TSI are boiler, duct and tank insulation, pipe and pipe fitting insulation. Surfacing materials are sprayed, troweled or otherwise applied to a surface and common uses are fireproofing, decorative and acoustical plaster applications. Miscellaneous materials include all ACM not listed as TSI or surfacing and include: flooring materials, ceiling tiles, adhesives, caulking and glazing compounds, damp-proofing/tars/mastics, roofing materials, transite cement board, sink undercoating, sheetrock and taping compounds, cove base materials and other materials. State of Connecticut DPH licensed asbestos inspectors Matthew Myers (#000041), James Raffin (#000373), and Brian Quinlan (#000921) performed the survey on 28 March 2019.

ACM Results Summary

Bulk sampling results are included as Tables 1 and 2 below. Analytical asbestos laboratory data is provided in Appendix A.

As required by the US EPA, samples were analyzed by individual layers (e.g. floor tile and the associated mastic were analyzed as two separate samples, rough and finish coat plasters, etc.). Bulk samples of the suspect asbestos-containing materials (ACM) were analyzed using the Polarized Light Microscopy (PLM) analytical methodology in accordance with EPA Protocol 600/R-93/116 and Non-friable Organically Bound (NOB) (e.g. flooring materials, roofing materials,
mastics) may have been additionally analyzed using PLM Point Count. The samples were analyzed by EMSL of Cinnaminson, New Jersey accredited by the National Voluntary Laboratory Program (NVLAP) and American Industrial Hygiene Association (AIHA).

Utilizing the US EPA sampling protocols and criteria, the following materials were determined to be **ACM or <1% Asbestos**:

**Table 1 – Summary of Asbestos-Containing Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>Location</th>
<th>% Asbestos and Sample ID</th>
<th>Estimated Quantity of ACM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transite Cement Board – Miscellaneous Material</td>
<td>Grill Room and Pro Shop - Inside Window Wall Lower Panels</td>
<td>ACM 10% Chrysotile 032804A</td>
<td>Estimate 100 Square Feet (16 Panels)</td>
</tr>
<tr>
<td>Floor Tiles/Black Mastic and Brown/Black/Yellow Flooring Materials (All Layers of Flooring Materials Contaminated, May Also Exist Under Sheetrock Walls) – Miscellaneous Materials</td>
<td>Pro Shop, Corridors, Grill Room, Women’s Locker Room and Entry, Office and Storage Rooms adjacent Men’s Locker Room, Men’s Locker Room (selective demolition may exclude some of these areas or portions of them)</td>
<td>ACM &lt;0.25 – 5% Chrysotile 032844A,B 032845A 032846 032848</td>
<td>Estimate Up to 5,750 Square Feet (selective demolition may exclude some of these areas or portions of them)</td>
</tr>
<tr>
<td>Mirror/Wall Adhesives – Miscellaneous Materials</td>
<td>Men’s and Women’s Locker Rooms/Toilet Rooms (most bulletin boards and mirrors were not glued to walls but a couple appear to be)</td>
<td>Assumed</td>
<td>Estimate 75 Square Feet</td>
</tr>
</tbody>
</table>
Utilizing the US EPA sampling protocol and criteria, the following materials were determined to be non-ACM:

### Table 2 – Summary of Non-Asbestos-Containing Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Location</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Fitting Insulation – Thermal System Insulation</td>
<td>Throughout Main Building</td>
<td>032801A-C</td>
</tr>
<tr>
<td>Rough and Finish Coat Plaster Ceilings – Surfacing Material</td>
<td>Locker Room Shower Areas</td>
<td>032802A-C, 032803A-C</td>
</tr>
<tr>
<td>Fiberglass Gray/Yellow Wall Adhesive – Miscellaneous Material</td>
<td>Kitchen</td>
<td>032805A, B</td>
</tr>
<tr>
<td>Black Slate Window Sill – Miscellaneous Material</td>
<td>Throughout Main Building</td>
<td>032806A, B</td>
</tr>
<tr>
<td>2’x2’ Sheetrock Ceiling Tiles, 2’x2’, and 2’x4’ Ceiling Tiles – Miscellaneous Materials</td>
<td>Throughout Main Building</td>
<td>032807A, B – 032810A-E</td>
</tr>
<tr>
<td>Material</td>
<td>Location</td>
<td>Sample ID</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Sheetrock and Taping Compounds – Miscellaneous Materials</td>
<td>Throughout Main Building</td>
<td>032811A,B</td>
</tr>
<tr>
<td></td>
<td>Boiler Room Building Ceiling</td>
<td>032812A,B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>032879A,B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>032880A,B</td>
</tr>
<tr>
<td>Cove Bases and Adhesives – Miscellaneous Materials</td>
<td>Throughout Main Building</td>
<td>032813 – 032820</td>
</tr>
<tr>
<td>Floor to Wall Black Expansion Material – Miscellaneous Material</td>
<td>Throughout Main Building</td>
<td>032821A,B</td>
</tr>
<tr>
<td>Fireplace Stone and Grout – Miscellaneous Materials</td>
<td>Grill Room</td>
<td>032822A,B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>032823</td>
</tr>
<tr>
<td>Ceramic Tile Floor Grouts, Mud Beds, Adhesives(Yellow), and Concrete – Miscellaneous Materials</td>
<td>Throughout Main Building</td>
<td>032824 – 032838A,B</td>
</tr>
<tr>
<td>Concrete Behind Interior Brick Wall – Miscellaneous Material</td>
<td>Grill Room</td>
<td>032839A,B</td>
</tr>
<tr>
<td>Carpet Adhesives – Miscellaneous Material</td>
<td>Throughout Main Building</td>
<td>032840A,B</td>
</tr>
<tr>
<td>Fake Wood Flooring – Miscellaneous Material</td>
<td>Grill Room Lounge</td>
<td>032841A,B</td>
</tr>
<tr>
<td>Thick Rubber Composite Flooring and Adhesives – Miscellaneous Materials</td>
<td>Pro Shop Office</td>
<td>032842A,B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>032843A,B</td>
</tr>
<tr>
<td>Interior Door and Window Caulking and Glazing Compounds – Miscellaneous Material</td>
<td>Throughout Main Building</td>
<td>032855A,B</td>
</tr>
<tr>
<td></td>
<td>Except as Noted Above</td>
<td>032857A,B – 032859A,B</td>
</tr>
<tr>
<td>Black Plastic at Foundation/ Block Junction – Miscellaneous Material</td>
<td>Throughout Main Building – Inside Exterior Wall</td>
<td>032860A,B</td>
</tr>
<tr>
<td>Exterior Wall Expansion Caulking Compounds, Door Caulking Compounds, and Window Caulking and Glazing Compounds – Miscellaneous Materials</td>
<td>Throughout Main Building</td>
<td>032862A,B – 032866A,B</td>
</tr>
<tr>
<td>Foundation Slab to Wall Expansion Joint – Miscellaneous Material</td>
<td>Exterior</td>
<td>032868A,B</td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Material</th>
<th>Location</th>
<th>Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Roof Shingles and Tar Papers</td>
<td>Main Building Roof</td>
<td>032868A,B – 032872A,B</td>
</tr>
<tr>
<td></td>
<td>Boiler Building Roof</td>
<td>032876A,B</td>
</tr>
<tr>
<td></td>
<td>Golf Cart Building</td>
<td>032877A,B</td>
</tr>
<tr>
<td></td>
<td>Storage Shed Behind Golf Cart Building</td>
<td>032882A,B – 032886A,B</td>
</tr>
<tr>
<td></td>
<td>Ranger Shack</td>
<td></td>
</tr>
<tr>
<td>White Brick Wall and Concrete Behind –</td>
<td>Main Building Exterior</td>
<td>032874A,B</td>
</tr>
<tr>
<td>Miscellaneous Materials</td>
<td></td>
<td>032875A,B</td>
</tr>
<tr>
<td>Black Paper Behind Wood Siding –</td>
<td>Golf Cart Building Exterior</td>
<td>032881A,B</td>
</tr>
<tr>
<td>Miscellaneous Material</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DISCLAIMERS:** Some locations/materials were not sampled during this survey due to accessibility.

**Foundations, Floor Slabs and Buried Piping and Mechanical Conduits** – Foundation/floor slab damp-proofing/tars/mastics may exist under the soil and asphalt on the building foundations and under the concrete flooring slab. It is not known how much of these or other materials are buried in the ground adjacent to/under the building. The survey included digging down 1-2 feet along the foundation where possible and damp-proofing was not found on the exposed foundations of the building in the limited areas checked. Asbestos containing insulation, transite cement piping and damp-proofing/tars/mastics may also exist on piping and mechanical conduits in the subsurface.

**Additional Suspect Materials/Inaccessible Materials** – Additional asbestos containing materials may exist that are currently inaccessible due to the damage required to access these materials. They include the following:

- Door insulation (a couple doors were checked and found not to contain suspect insulation),
- Inside boilers, HVAC units and mechanical units (appear to be newer and should not contain asbestos),
- Electrical Insulation (cannot sample with power active),
- Materials inside Walk-In Coolers and behind Floor Slop Sinks (tars, damp-proofing,
adhesives, etc.),

- Vermiculite within wall cavities (sometimes limited to boiler room and mechanical room walls or could be throughout – did not see evidence of vermiculite in a couple areas investigated),

- Wall adhesives throughout behind mirrors, bulletin boards, display areas in pro shop, etc. (checked in several locations),

- Pipe/pipe fitting/duct insulation within chases (sampled accessible materials in attic and closet – may or may not be same materials that will become accessible during demolition),

- Transite cement boards/panels (behind soffits, overhangs, siding, window wall panels, fireplace and kitchen wall materials, etc.),

- Adhesives/other materials under black slate window sills,

- Black window glazing compounds in Marshal/Superintendents Booth Structure (need to break window to access),

- Wall materials (adhesives, transite cement board, etc.) behind interior brick and wood walls (grill room and other locations), fireplace, etc.,

- Additional flooring materials (checked every room, sometimes in multiple locations – materials found beneath carpeting and other flooring materials were not uniform in the areas checked),

- Wall adhesives behind exterior siding/soffits/etc. and behind foam board or other wall materials under siding/soffits/etc., and

- Older caulking materials located behind newer caulking materials (air conditioning units, exhaust vents – appeared to only be newer sealants).

### 3.0 LEAD-BASED PAINT XRF SAMPLING

A lead paint screening was performed throughout using an X-Ray Fluorescence (XRF) lead paint analyzer. Brian Quinlan, a State of Connecticut DPH Certified Lead Inspector (#002240) performed the lead screening using a Niton XLp300.
No LBP was identified exceeding the HUD/EPA action level of equal to or greater than 1.0 mg/cm$^2$
Detailed XRF screening result field sheets are provided in Appendix B.

Contractors completing demolition activities should be aware that OSHA has not established a level of lead in a material below which 29 CFR 1926.62 does not apply. The contractor shall comply with exposure assessment criteria, interim worker protection and other requirements of the regulation as necessary to protect workers and occupants.

The information in this report does not constitute a comprehensive lead inspection under the Connecticut Department of Public Health Regulations, Section 19a-111-1 to 11. The survey was an XRF lead screening utilizing an XRF and does not satisfy the testing requirements of US EPA’s Renovation, Repair and Painting Rule (RRP) under 40 CFR 745.80 through 92. Reliance on this report for determining RRP or CT DPH applicability is not authorized by Langan.

4.0 PCB SOURCE SAMPLING

In recent years, the United States Environmental Protection Agency (US EPA) has learned that building sealants (e.g. caulking, glazing, expansion joint sealant compounds and other building materials) containing potentially harmful PCBs were used in many buildings in the 1950s through the 1980s. PCBs were added to building sealants for durability, resistance to degradation, and as a softener/plasticizer for application.

Ten samples of suspect PCB-containing source materials were collected and analyzed using EPA Method 3540C (Soxhlet extraction) and EPA Method 8082. The PCB samples were submitted for analysis to a NELAP accredited environmental testing laboratory, Phoenix Environmental Laboratories, Inc. (Connecticut # PH-0618). Analytical results are provided in Appendix C.
Table 3 – Summary of Limited PCB Source Sample Results

<table>
<thead>
<tr>
<th>Location - Material</th>
<th>Sample ID</th>
<th>PCB Results – mg/kg or ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior Expansion Joint Caulking Compounds</td>
<td>EEJC-01</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>EEJC-02</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>EEJC-03</td>
<td>ND</td>
</tr>
<tr>
<td>Exterior Door Caulking Compounds</td>
<td>EDC-01</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>EDC-02</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>EDC-03</td>
<td>ND</td>
</tr>
<tr>
<td>Interior/Exterior Window Caulking Compounds</td>
<td>WC-01</td>
<td>1.4</td>
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<td></td>
<td>WC-02</td>
<td>ND</td>
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<tr>
<td></td>
<td>WC-03</td>
<td>6.6</td>
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<tr>
<td>Interior Paint</td>
<td>IP-01</td>
<td>0.51</td>
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</table>

Based on the analytical laboratory results, one of the source materials contains PCBs, at or above 1 ppm and below 50 ppm. The overall PCB concentrations ranged from none detected to 6.6 ppm. The following compounds were found to have greater than 1 ppm and less than 50 ppm PCB:

- Interior/Exterior Window Caulking Compounds

Some window caulking compounds exceeded the CT DEEP regulatory limit of 1 ppm but did not exceed the US EPA regulatory limit of 50 ppm.

5.0 UNIVERSAL WASTE ASSESSMENT

Completion of detailed Universal Waste Assessment (identifying the number and location of Universal Waste items) was not conducted as part of this Pre-Demolition Hazardous Building Materials Survey. However, several universal waste items were observed during our building walkthrough. Universal wastes include suspect PCB/DEHP (di (2-ethylhexyl) phthalate) ballasts/capacitors associated with light fixtures, mercury-containing florescent and other mixed used high intensity light bulbs, smoke detectors and other alarms/sensors containing suspect radioactive materials and batteries may be present, mercury-containing thermostats, gauges, electronics, paints, air conditioning and cooler and freezer materials/CFCs, wiring, cleaning and other chemicals.
All universal/hazardous waste that is present in the building will need to be properly removed, recycled, and/or disposed of at a landfill permitted to accept such waste. The removal, handling, recycling, and disposal must be performed in accordance with applicable federal, state, and local regulations.

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

Langan provides the following conclusions and recommendations, based on the findings of this NESHAP Pre-Demolition Hazardous Building Materials Survey:

Both friable and non-friable ACM was identified in the subject building. Prior to demolition, the identified ACM must be properly removed and disposed in accordance with applicable federal, state and local regulations by a State of Connecticut DPH licensed asbestos abatement contractor. A State of Connecticut licensed Asbestos Designer should create specifications and an Asbestos Project Monitor should perform project oversight and air testing in accordance with the federal and state regulations. These are all requirements of the CT DPH Standards. Additional sampling/destructive sampling/visual investigation may be required for materials that have not been sampled to date due to the damage required to access them (inaccessible materials, hidden materials behind walls, ceilings and floors, buried materials, damp-proofing under concrete slabs, etc.).

Contractors completing demolition activities should be aware that OSHA has not established a level of lead in a material below which 29 CFR 1926.62 does not apply. All contractors working on the project are responsible for having adequate training (RRP or greater amount) and performing their own OSHA compliance requirements. Contractor shall comply with exposure assessment criteria, interim worker protection and other requirements of the regulation as necessary to protect workers and occupants/residents. Langan recommends a lead safe work practices specification for the project. All contractors must comply with all applicable State and Federal regulations, including but not limited to the lead OSHA regulations.

Langan performed limited PCB source sampling of sealants and paint and found the interior/exterior window caulking compound materials contain PCBs greater than 1 ppm but less than 50 ppm. Source materials containing greater than 1 but less than 50 ppm PCBs must be removed and disposed of in accordance with CT DEEP regulations/requirements. PCB remediation and disposal specifications will be required for the project.
All universal/hazardous waste that is present in the building has to be properly removed, recycled, and/or disposed of at a landfill permitted to accept such waste. The removal, handling, recycling and disposal must be performed in accordance with applicable federal, State, and local regulations. Langan recommends a universal waste recycling/disposal specification for the project.

7.0 LIMITATIONS

The conclusions and recommendations presented in this report are professional opinions based solely upon Langan’s visual observations, laboratory test data, and current regulatory requirements. These conclusions and recommendations are intended exclusively for the purpose stated herein, at the site indicated, and for the project indicated.

It is important to recognize that even the most comprehensive scope of services may fail to detect all hazmat that may be associated with the property. Therefore, Langan cannot act as insurers and cannot “certify” that all hazardous building materials associated with the property have been identified, and no expressed or implied representation or warranty is included or intended in our report, except that our services were performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

Any suspect material that is not listed in this report must be assumed as ACM, PCBs, lead-based paint, etc. until confirmed otherwise via laboratory testing.
Appendix A

Asbestos Analytical Laboratory Results and Chain-of-Custody
## Asbestos Bulk Building Material
### Chain of Custody
#### EMSL Order Number (Lab Use Only):

<table>
<thead>
<tr>
<th>Company</th>
<th>Langan CT</th>
</tr>
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<tbody>
<tr>
<td>Street</td>
<td>555 Long Wharf Drive</td>
</tr>
<tr>
<td>City</td>
<td>New Haven</td>
</tr>
<tr>
<td>State/Province</td>
<td>CT</td>
</tr>
<tr>
<td>Zip/Postal Code</td>
<td>06514</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td>Report To Name</td>
<td>Matthew Myers</td>
</tr>
<tr>
<td>Email Address</td>
<td><a href="mailto:MMyers@Langan.com">MMyers@Langan.com</a></td>
</tr>
</tbody>
</table>

### Project Information:
- **Project Name/Number:** 1401_25502/HSR 6/24
- **Contact:** Langan
- **Billing:** Public Project
- **Billing:** Third Party Billing requires written authorization from third party

### Registration Information:

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### Sampling Information:

**Sampler:** Matthew Myers

### Sample Data:

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<th>Sample Location</th>
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<td></td>
<td>Attic (men shower)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>1st Floor Mech. Closet</td>
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<tr>
<td>032802A</td>
<td>A</td>
<td>Women Showers</td>
<td>Finish White Coat, Plaster Ceiling</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Men's Shower</td>
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</tr>
<tr>
<td>C</td>
<td></td>
<td>Women Showers</td>
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</tr>
</tbody>
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### Client Information:

- **Sampled By:** Matthew Myers
- **Sampled On:** 3/28/19

### Receiving Information:

- **Received (Lab):** 4-2-19
- **Time:** 8:25 AM

### Comments:

---

* Controlled Document - Asbestos CDC - Rev - 11/23/2012

Page 1 of 7 pages
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<td></td>
<td>1 C</td>
<td>Men's Corridor</td>
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</tr>
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<td>1 D</td>
<td>Women's Corridor</td>
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<td>1 C</td>
<td>Women's Corridor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 D</td>
<td>Men's Corridor</td>
<td></td>
</tr>
<tr>
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<td>1 E</td>
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<td>Crue Base (Vinyl)</td>
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<td>1 B</td>
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*Comments/Special Instructions:*
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<td>22B</td>
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<td>Fireplace Grout</td>
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<td>Pro Shop Storage #1</td>
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<td>25</td>
<td>Bathroom, Shower/toilet</td>
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<td>Grill Room</td>
<td>mid Bed</td>
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<td>Corridor Toilet</td>
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<td>Womens</td>
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<td>Pro Shop Storage #1</td>
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<tbody>
<tr>
<td>032838A</td>
<td>1 A</td>
<td>Women's Shower / Tub</td>
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<tr>
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<td>Men</td>
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</tr>
<tr>
<td>40A</td>
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<td>Grill Room</td>
<td>Concrete Behind Brick Wall</td>
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<td>Locker Room</td>
<td>Carpet Adhesive Yellow</td>
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<td>Lounge</td>
<td>Fake Wood Flooring</td>
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<td>43A</td>
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<td>Pro Shop Office</td>
<td>Rubber Tired Composite Floor</td>
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<td>Pro Shop</td>
<td>Flax tile under carpet</td>
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<tr>
<td>45A</td>
<td></td>
<td>L B</td>
<td>Black Mastic Yar</td>
</tr>
<tr>
<td>46</td>
<td>8 B</td>
<td>Mens Locker Room</td>
<td>Brown/Black Material under carpet</td>
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<td>47</td>
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<td>Pro Shop Storage</td>
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<td>Building Locker Arm Entry Hall</td>
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<td>Women's Locker Arm</td>
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<td>Corridor (Storage) 4 to outside</td>
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<td>L B</td>
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<td>53</td>
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<td>Black material under parking</td>
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*Comments/Special Instructions:
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<td>39A</td>
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<td>Interior Windows Caulk</td>
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<td>15A</td>
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<tr>
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<td></td>
<td></td>
<td>Int. Door Caulk - Glass</td>
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<td>77A</td>
<td>15A</td>
<td>Pro Shop Corridor</td>
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</tr>
<tr>
<td>58A</td>
<td>15A</td>
<td>Front Door</td>
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<td>60A</td>
<td></td>
<td>Exterior</td>
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<td>15A</td>
<td>Inside Ext Wall</td>
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<td>61A</td>
<td>15A</td>
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<td>63A</td>
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*Comments/Special Instructions:
## Asbestos Bulk Building Material
### Chain of Custody

**EMSL Order Number** (Lab Use Only):

```
041906735
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Additional Pages of the Chain of Custody are only necessary if needed for additional sample information.

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<td>Exterior</td>
<td>Window Cowl (Grill) - Gray Screen</td>
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<tr>
<td>67A</td>
<td>1</td>
<td></td>
<td>(Grill) White Hard</td>
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<td>49A</td>
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<td>(Rosin)</td>
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<td>69A</td>
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<td>Slab Floor Expansion Joint Block</td>
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<td>72A</td>
<td>1</td>
<td>Upper Roof</td>
<td>Top Layer Roof Shingle Gray</td>
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<tr>
<td>71A</td>
<td>1</td>
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<td>Red Bottom Layer Shingle</td>
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<td>Middle Layer Shingle</td>
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<td>72A</td>
<td>B</td>
<td>Upper Roof</td>
<td>Bottom Layer Shingle</td>
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<td>B</td>
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<td>Black Tar Paper Under Shingles</td>
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<td>Petroleum Flashing</td>
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<td>White Birch Wall</td>
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<td>B</td>
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<td>Concrete Behind</td>
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<tr>
<td>76A</td>
<td>B</td>
<td>Boiler Bldg</td>
<td>Roof Shingle</td>
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<tr>
<td>77A</td>
<td>B</td>
<td></td>
<td>Tar paper under Shingle</td>
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*Comments/Special Instructions:*
# Asbestos Bulk Building Material Chain of Custody

**EMSL Order Number (Lab Use Only):**

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<td>Boiler Bldg.</td>
<td>Roof Flashes</td>
</tr>
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<td>4</td>
<td>7/4</td>
<td>Interior</td>
<td>Sheetrock Ceiling</td>
</tr>
<tr>
<td>4</td>
<td>8/4</td>
<td></td>
<td>Taping Compound</td>
</tr>
<tr>
<td>81A</td>
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<td>Golf Cart Bldg.</td>
<td>Block Paper Behind Siding</td>
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*Comments/Special Instructions:

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**Page 7 of 7 pages**
Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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<th>Lab Sample ID</th>
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<th>Comment</th>
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<td>80.0%</td>
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<td>041908735-0002</td>
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<td>4/07/2019</td>
<td>Beige</td>
<td>20.0%</td>
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<td>041908735-0003</td>
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<td>Women's Showers/ Fresh White Coat Plaster Ceiling</td>
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# Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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### Test Results

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<th>Asbestos</th>
<th>Comment</th>
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### Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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**Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116**

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## Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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### Sample Description: Pro Shop Office/Cove Base - Vinyl

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### Sample Description: Corridor - Storage/Cove Base - Vinyl

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### Sample Description: Main Corridor/Cove Base - Vinyl

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<tbody>
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### Sample Description: Pro Shop Office/Cove Base Adhesive - Tan

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### Sample Description: Corridor - Storage/Cove Base Adhesive - Tan and White

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### Sample Description: Pro Shop/Cove Base Adhesive - Yellow and Tan

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### Sample Description: Main Corridor/Cove Base Adhesive - Brown

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### Sample Description: Pro Shop/Cove Base Adhesive - Brown

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# Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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## Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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<td>4/07/2019</td>
<td>White</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
<td></td>
</tr>
<tr>
<td>032832</td>
<td>041908735-0053</td>
<td>Grill Room/Ceramic Floor Tile Mude Bed</td>
<td>4/04/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
<td></td>
</tr>
<tr>
<td>032833</td>
<td>041908735-0054</td>
<td>Corridor Toilet/Ceramic Floor Tile Mude Bed</td>
<td>4/04/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
<td></td>
</tr>
<tr>
<td>032834</td>
<td>041908735-0055</td>
<td>Men’s Shower and Toilet/Ceramic Floor Tile Mude Bed</td>
<td>4/04/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
<td></td>
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**Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116**

<table>
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<tr>
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<th>Lab Sample ID: 041908735-0056</th>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Women's Shower and Toilet/Ceramic Floor Tile Mude Bed</td>
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</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<th>Lab Sample ID: 041908735-0057</th>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Proshop Storage #1/Ceramic Floor Tile Mude Bed</td>
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</table>

<table>
<thead>
<tr>
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<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<th>Lab Sample ID: 041908735-0058</th>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Proshop Storage #1/Mud Bed Adhesive - Yellow</td>
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<table>
<thead>
<tr>
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<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
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<td>None Detected</td>
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<td><strong>Sample Description:</strong></td>
<td>Proshop Storage #1/Mud Bed Adhesive - Yellow</td>
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<table>
<thead>
<tr>
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<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
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<tbody>
<tr>
<td>PLM</td>
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<td>Yellow</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<th>Lab Sample ID: 041908735-0060</th>
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<tr>
<td><strong>Sample Description:</strong></td>
<td>Women's Shower and Toilet/Gray Concrete under Mud Bed</td>
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<table>
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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<tr>
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</tr>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Men's Shower and Toilet/Gray Concrete under Mud Bed</td>
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</tbody>
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<table>
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<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<th>Lab Sample ID: 041908735-0062</th>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Grill Room/Concrete behind Interior Brick Walls</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<table>
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<tr>
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<tbody>
<tr>
<td><strong>Sample Description:</strong></td>
<td>Grill Room/Concrete behind Interior Brick Walls</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
</tr>
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</table>
## Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

### Client Sample ID: 032840A
**Sample Description:** Locker Room/Carpet Adhesive Yellow

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Yellow</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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### Client Sample ID: 032840B
**Sample Description:** Locker Room/Carpet Adhesive Yellow

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Yellow</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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### Client Sample ID: 032841A
**Sample Description:** Lounge/Fake Wood Flooring

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Brown</td>
<td>90.0%</td>
<td>10.0%</td>
<td>None Detected</td>
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### Client Sample ID: 032841B
**Sample Description:** Lounge/Fake Wood Flooring

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Brown</td>
<td>70.0%</td>
<td>30.0%</td>
<td>None Detected</td>
<td></td>
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</table>

### Client Sample ID: 032842A
**Sample Description:** Pro Shop Office/Rubber Thick Composite Floor

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Black</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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</table>

### Client Sample ID: 032842B
**Sample Description:** Pro Shop Office/Rubber Thick Composite Floor

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Black</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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</table>

### Client Sample ID: 032843A
**Sample Description:** Pro Shop Office/Rubber Thick Yellow Adhesive

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Yellow</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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</table>

### Client Sample ID: 032843B
**Sample Description:** Pro Shop Office/Rubber Thick Yellow Adhesive

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Yellow</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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### Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
<th>Sample Description</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>032844A</td>
<td>041908735-0072</td>
<td>Pro Shop/Floor Tile under Carpet</td>
<td>0.0%</td>
<td>100.0%</td>
<td>&lt;0.25% Chrysotile Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.</td>
</tr>
<tr>
<td>032844B</td>
<td>041908735-0073</td>
<td>Pro Shop/Floor Tile under Carpet</td>
<td>0.0%</td>
<td>100.0%</td>
<td>&lt;0.25% Chrysotile Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.</td>
</tr>
<tr>
<td>032845A</td>
<td>041908735-0074</td>
<td>Pro Shop/Black Mastic for above</td>
<td></td>
<td></td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>032845B</td>
<td>041908735-0075</td>
<td>Pro Shop/Black Mastic for above</td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
</tr>
<tr>
<td>032846</td>
<td>041908735-0076</td>
<td>Men's Locker Room/Brown and Black Material under Carpet</td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
</tr>
<tr>
<td>032847</td>
<td>041908735-0077</td>
<td>Pro Shop Storage/Brown and Black Material under Carpet</td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
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<tr>
<td>032848</td>
<td>041908735-0078</td>
<td>Women's Locker Room Entry Hall/Black and Brown and Yellow Material under Carpet</td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
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**Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116**

### Client Sample ID: 032849
**Sample Description:** Women's Locker Room/Black and Brown and Yellow Material under Carpet

<table>
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<th>Non-Asbestos Fibrous</th>
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<th>Asbestos</th>
<th>Comment</th>
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<tbody>
<tr>
<td>PLM</td>
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<td></td>
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<td>Positive Stop (Not Analyzed)</td>
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### Client Sample ID: 032850
**Sample Description:** Corridor Storage to Outside/Black and Brown and Yellow Material under Carpet

<table>
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<th>Color</th>
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<th>Non-Asbestos Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
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<tbody>
<tr>
<td>PLM</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
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### Client Sample ID: 032851
**Sample Description:** Grill Room/Black and Brown and Yellow under Fake Wood Floor

<table>
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<th>Non-Asbestos Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>400 PLM Pt Cl</td>
<td>4/06/2019</td>
<td>Brown/Black/Yellow</td>
<td>0.00%</td>
<td>99.50%</td>
<td>0.50% Chrysotile</td>
<td>Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.</td>
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### Client Sample ID: 032852
**Sample Description:** Grill Room/Black and Brown and Yellow under Carpet Wood

<table>
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<th>Non-Asbestos Fibrous</th>
<th>Non-Asbestos Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 PLM Pt Cl</td>
<td>4/06/2019</td>
<td>Brown/Yellow</td>
<td>0.00%</td>
<td>99.25%</td>
<td>0.75% Chrysotile</td>
<td>Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.</td>
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### Client Sample ID: 032853
**Sample Description:** Grill Room/Black Material under Parking

<table>
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<th>Asbestos</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>400 PLM Pt Cl</td>
<td>4/05/2019</td>
<td>Brown</td>
<td>0.00%</td>
<td>99.25%</td>
<td>0.75% Chrysotile</td>
<td>Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.</td>
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### Client Sample ID: 032854A
**Sample Description:** Grill Room/Interior Window Caulk

<table>
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<th>Color</th>
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<th>Non-Asbestos Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
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<td>White</td>
<td>0.0%</td>
<td>96.0%</td>
<td>4% Chrysotile</td>
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### Client Sample ID: 032854B
**Sample Description:** Grill Room/Interior Window Caulk

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<td>4/04/2019</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive Stop (Not Analyzed)</td>
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## Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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<tbody>
<tr>
<td>032855A</td>
<td>041908735-0086</td>
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### Test 1: Women's Locker Room/Interior Window Caulk

<table>
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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>PLM</td>
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<td>Gray</td>
<td>0.0%</td>
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<td>None Detected</td>
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<table>
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</thead>
<tbody>
<tr>
<td>032855B</td>
<td>041908735-0087</td>
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### Test 2: Men's Locker Room/Interior Window Caulk

<table>
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<tr>
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<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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<table>
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</tr>
</thead>
<tbody>
<tr>
<td>032856A</td>
<td>041908735-0068</td>
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### Test 3: Kitchen/Interior Door Caulk - Entrance - White

<table>
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<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>White</td>
<td>0.0%</td>
<td>94.0%</td>
<td>6% Chrysotile</td>
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</table>

<table>
<thead>
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<th>Client Sample ID</th>
<th>Lab Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>032856B</td>
<td>041908735-0089</td>
</tr>
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### Test 4: Kitchen/Interior Door Caulk - Rear Door - White

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### Test 5: Pro Shop Corridors/Interior Door Caulk

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### Test 7: Grill Room/Interior Newer Black Window Glaze

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### Test 8: Grill Room/Interior Newer Black Window Glaze

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# Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

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## Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

### Client Sample ID: 032867A
**Sample Description:** Exterior/Window Caulk Grill - White Hard

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### Client Sample ID: 032867B
**Sample Description:** Exterior/Window Caulk Pro Shop - White Hard

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### Client Sample ID: 032868A
**Sample Description:** Exterior/Slab and Wall Expansion Joint - Black

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### Client Sample ID: 032868B
**Sample Description:** Exterior/Slab and Wall Expansion Joint - Black

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### Client Sample ID: 032869A
**Sample Description:** Upper Roof/Top Layer Roof Shingle - Gray

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<th>TEST</th>
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<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Gray/Black</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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</tr>
</tbody>
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### Client Sample ID: 032869B
**Sample Description:** Upper Roof/Top Layer Roof Shingle - Gray

<table>
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<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
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<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Gray/Black</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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</tr>
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### Client Sample ID: 032870A
**Sample Description:** Upper Roof/Bottom Layer Shingle

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
<td>Tan/Black</td>
<td>5.0%</td>
<td>95.0%</td>
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### Client Sample ID: 032870B
**Sample Description:** Upper Roof/Middle Layer Shingle

<table>
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<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
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<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>4/05/2019</td>
<td>Tan/Black</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

<table>
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<tbody>
<tr>
<td>032871A</td>
<td>041908735-0118</td>
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**Sample Description:** Upper Roof/Bottom Layer Shingle

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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/04/2019</td>
<td>Tan/Black</td>
<td>5.0%</td>
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<td>041908735-0119</td>
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**Sample Description:** Upper Roof/Bottom Layer Shingle

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<th>Asbestos</th>
<th>Comment</th>
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<tbody>
<tr>
<td></td>
<td>4/05/2019</td>
<td>Tan/Black</td>
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<td>95.0%</td>
<td>None Detected</td>
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<tbody>
<tr>
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**Sample Description:** Upper Roof/Black Tar Paper under Shingles

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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/04/2019</td>
<td>Black</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
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</thead>
<tbody>
<tr>
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<td>041908735-0121</td>
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**Sample Description:** Upper Roof/Black Tar Paper under Shingles

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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/05/2019</td>
<td>Black</td>
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<th>Client Sample ID</th>
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<tbody>
<tr>
<td>032873A</td>
<td>041908735-0122</td>
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**Sample Description:** Upper Roof/Penetration Flashing

<table>
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<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/04/2019</td>
<td>Black</td>
<td>0.0%</td>
<td>95.0%</td>
<td>5% Chrysotile</td>
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</table>

<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>032873B</td>
<td>041908735-0123</td>
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**Sample Description:** Upper Roof/Penetration Flashing

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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/04/2019</td>
<td>Black</td>
<td>Positive Stop (Not Analyzed)</td>
<td>None Detected</td>
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<table>
<thead>
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<tbody>
<tr>
<td>032874A</td>
<td>041908735-0124</td>
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**Sample Description:** Upper Roof/White Brick Wall

<table>
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<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/04/2019</td>
<td>White</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>032874B</td>
<td>041908735-0125</td>
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**Sample Description:** Upper Roof/White Brick Wall

<table>
<thead>
<tr>
<th>TEST</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4/05/2019</td>
<td>White</td>
<td>0.0%</td>
<td>100.0%</td>
<td>None Detected</td>
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</table>
### Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>032875A</td>
<td>041908735-0126</td>
</tr>
<tr>
<td>upper roof/concrete behind brick wall</td>
<td></td>
</tr>
<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
<td>4/04/2019</td>
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<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>032875B</td>
<td>041908735-0127</td>
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<tr>
<td>upper roof/concrete behind brick wall</td>
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<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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</thead>
<tbody>
<tr>
<td>032876A</td>
<td>041908735-0128</td>
</tr>
<tr>
<td>boiler bldg/roof shingle</td>
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<tr>
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<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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<table>
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<tr>
<td>boiler bldg/roof shingle</td>
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</tr>
<tr>
<td>PLM</td>
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<tbody>
<tr>
<td>032877A</td>
<td>041908735-0130</td>
</tr>
<tr>
<td>boiler bldg/tar paper under shingle</td>
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<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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<tbody>
<tr>
<td>032877B</td>
<td>041908735-0131</td>
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<tr>
<td>boiler bldg/tar paper under shingle</td>
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<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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<table>
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</thead>
<tbody>
<tr>
<td>032878A</td>
<td>041908735-0132</td>
</tr>
<tr>
<td>boiler bldg - exterior/penetration roof flashing</td>
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<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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<table>
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<th>Lab Sample ID</th>
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</thead>
<tbody>
<tr>
<td>032878B</td>
<td>041908735-0133</td>
</tr>
<tr>
<td>boiler bldg - exterior/penetration roof flashing</td>
<td></td>
</tr>
<tr>
<td><strong>TEST</strong></td>
<td><strong>Analyzed Date</strong></td>
</tr>
<tr>
<td>PLM</td>
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Page 17 of 20
<table>
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<th>Analyzed Date</th>
<th>Color</th>
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<th>Comment</th>
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<tbody>
<tr>
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<td>041908735-0134</td>
<td>Boiler Bldg - Interior/Sheetrock - Ceiling</td>
<td>PLM</td>
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<td>Tan/White</td>
<td>20.0% Fibrous</td>
<td>80.0% Non-Fibrous</td>
<td>None Detected</td>
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<tr>
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<td>041908735-0135</td>
<td>Boiler Bldg - Interior/Sheetrock - Ceiling</td>
<td>PLM</td>
<td>4/05/2019</td>
<td>Tan/White</td>
<td>20.0% Fibrous</td>
<td>80.0% Non-Fibrous</td>
<td>None Detected</td>
</tr>
<tr>
<td>032880A</td>
<td>041908735-0136</td>
<td>Boiler Bldg - Interior/Taping Compound</td>
<td>PLM</td>
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<td>White</td>
<td>0.0% Fibrous</td>
<td>100.0% Non-Fibrous</td>
<td>None Detected</td>
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<tr>
<td>032880B</td>
<td>041908735-0137</td>
<td>Boiler Bldg - Interior/Taping Compound</td>
<td>PLM</td>
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<td>White</td>
<td>0.0% Fibrous</td>
<td>100.0% Non-Fibrous</td>
<td>None Detected</td>
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<tr>
<td>032881A</td>
<td>041908735-0138</td>
<td>Golf Cart Bldg/Black Paper behind Siding</td>
<td>PLM</td>
<td>4/04/2019</td>
<td>Black</td>
<td>25.0% Fibrous</td>
<td>75.0% Non-Fibrous</td>
<td>None Detected</td>
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<td>041908735-0139</td>
<td>Golf Cart Bldg/Black Paper behind Siding</td>
<td>PLM</td>
<td>4/05/2019</td>
<td>Black</td>
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<td>70.0% Non-Fibrous</td>
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<tr>
<td>032882A</td>
<td>041908735-0140</td>
<td>Golf Cart Bldg/Roof Shingles - Brownish</td>
<td>PLM</td>
<td>4/04/2019</td>
<td>Brown/Black</td>
<td>5.0% Fibrous</td>
<td>95.0% Non-Fibrous</td>
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<td>032882B</td>
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<td>Golf Cart Bldg/Roof Shingles - Brownish</td>
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<td>Brown/Black</td>
<td>10.0% Fibrous</td>
<td>90.0% Non-Fibrous</td>
<td>None Detected</td>
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</table>
# Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116

<table>
<thead>
<tr>
<th>Client Sample ID</th>
<th>Lab Sample ID</th>
<th>Sample Description</th>
<th>Analyzed Date</th>
<th>Color</th>
<th>Non-Asbestos Fibrous</th>
<th>Non-Fibrous</th>
<th>Asbestos</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>032883A</td>
<td>041908735-0142</td>
<td>Golf Cart Bldg/Roof Shingles - Blueish</td>
<td>4/04/2019</td>
<td>Black/Blue</td>
<td>5.0%</td>
<td>95.0%</td>
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<tr>
<td>032883B</td>
<td>041908735-0143</td>
<td>Golf Cart Bldg/Roof Shingles - Blueish</td>
<td>4/05/2019</td>
<td>Black/Blue</td>
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<td>041908735-0144</td>
<td>Golf Cart Bldg/Black Paper under Roof Shingles</td>
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<td>041908735-0145</td>
<td>Golf Cart Bldg/Black Paper under Roof Shingles</td>
<td>4/04/2019</td>
<td>Red/Black/Blue</td>
<td>13.0%</td>
<td>87.0%</td>
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<tr>
<td>032885A</td>
<td>041908735-0146</td>
<td>Storage Shed behind Golf Carts/Roof Shingles - Blue and Red</td>
<td>4/04/2019</td>
<td>Red/Black/Blue</td>
<td>15.0%</td>
<td>85.0%</td>
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<tr>
<td>032885B</td>
<td>041908735-0147</td>
<td>Ranger Shack/Roof Shingles - Blue and Red</td>
<td>4/04/2019</td>
<td>Red/Black/Blue</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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<tr>
<td>032886A</td>
<td>041908735-0148</td>
<td>Storage Shed behind Golf Carts/Roof Shingles - Tan and White</td>
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<td>Tan/Black</td>
<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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<tr>
<td>032886B</td>
<td>041908735-0149</td>
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<td>5.0%</td>
<td>95.0%</td>
<td>None Detected</td>
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Analytic(s):

<table>
<thead>
<tr>
<th>Analyst</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy Johnson</td>
<td>400 PLM Pt Ct (2)</td>
</tr>
<tr>
<td>Andrew Burke</td>
<td>PLM (16)</td>
</tr>
<tr>
<td></td>
<td>400 PLM Pt Ct (4)</td>
</tr>
<tr>
<td>Ebony Miller</td>
<td>PLM (28)</td>
</tr>
<tr>
<td>Jesus Cuevas</td>
<td>PLM (21)</td>
</tr>
<tr>
<td>John Flanagan</td>
<td>PLM (10)</td>
</tr>
<tr>
<td>Jonathan Blanfort</td>
<td>PLM (2)</td>
</tr>
<tr>
<td>Laura Kantor</td>
<td>PLM (45)</td>
</tr>
<tr>
<td>Nancy Stalter</td>
<td>PLM (10)</td>
</tr>
</tbody>
</table>

Reviewed and approved by:

[Signature]

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. This test report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. EMSL bears no responsibility for sample collection activities or analytical method limitations. The laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples. PLM alone is not consistently reliable in detecting asbestos in floor coverings and similar NOBs.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, LA #04127

Initial report from: 04/04/2019 10:18:25
Appendix B

XRF Lead Testing Field Data Sheets
<table>
<thead>
<tr>
<th>Survey Door Room ID/ Test Location</th>
<th>Component</th>
<th>Substrate Paint Color</th>
<th>Exterior XRF Readings mg/cm²</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>ID# 1 Natural Cal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Emain Entrance Door</td>
<td>Door</td>
<td>Wood</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>3 Emain Entrance Door</td>
<td>Frame</td>
<td>Metal</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>4 loggia</td>
<td>Window</td>
<td>Metal</td>
<td>0.0</td>
<td></td>
</tr>
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Appendix C

PCB Analytical Laboratory Results and Chain-of-Custody
Thursday, April 04, 2019

Attn: Matt Myers
Langan Engineering
555 Long Wharf Drive 9th Fl
New Haven, CT 06511

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
SDG ID: GCC78118
Sample ID#s: CC78118 - CC78127

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301                NJ Lab Registration #CT-003
CT Lab Registration #PH-0618     NY Lab Registration #11301
MA Lab Registration #M-CT007     PA Lab Registration #68-03530
ME Lab Registration #CT-007      RI Lab Registration #63
NH Lab Registration #213693-A,B  UT Lab Registration #CT00007
                                      VT Lab Registration #VT11301
## Sample Id Cross Reference

April 04, 2019

SDG I.D.: GCC78118

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### Chain of Custody Record

**Phoenix Environmental Laboratories, Inc.**

- **Customer:** Langen CT - Matthew Myers
- **Address:** 555 Long Wharf Drive, New Haven CT 06511
- **Project:** HSRC Golf Course Project P.O. #140195562
- **Report to:** Matthew Myers
- **Invoice to:** Langan - Invoice Capture

**Signature:** [Signature]

**Date:** 3/28/19

**Matrix Code:**
- DW = Drinking Water
- GW = Ground Water
- SW = Surface Water
- WW = Waste Water
- RW = Raw Water
- SE = Sediment
- SL = Sludge
- S = Soil
- SD = Solid
- W = Wipe
- OI = Oil
- B = Bulk
- L = Liquid

**PHOENIX USE ONLY**

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**Relinquished By:** [Signature]

**Accepted By:** [Signature]

**Date:** 3/28/19

**Time:** 11:29 AM

**Comments, Special Requirements or Regulations:**
- EEIC - Expanded Expansion Joint Caulk
- WC - Concrete Caulk
- JP - Intake Point

**Turnaround:**
- 1 Day
- 2 Days
- 3 Days
- Standard

**SURCHARGE APPLIES**

**State where samples were collected:** CT - Tax Public Buildings Project
## Analysis Report

April 04, 2019

### Sample Information
- **Matrix:** CAULK
- **Location Code:** LANGAN
- **Rush Request:** Standard
- **P.O. #:**

### Custody Information
- **Collected by:**
- **Received by:** CP
- **Analyzed by:** see "By" below

### Date
- **03/28/19**
- **03/30/19**

### Time
- **13:00**
- **15:29**

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RL/PQL=Reporting/Practical Quantitation Level  ND=Not Detected  BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an "as received" basis, and are not corrected for dry weight.

PCB Comment:
For PCBs, in order to reach the desired RL, multiple cleanup steps were performed. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional Florisil.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
Analysis Report
April 04, 2019

FOR: Attn: Matt Myers
      Langan Engineering
      555 Long Wharf Drive 9th Fl
      New Haven, CT 06511

Sample Information
Matrix: CAULK
Location Code: LANGAN
Rush Request: Standard
P.O.:

Custody Information
Collected by: 
Received by: CP
Analyzed by: see "By" below

Date  Time
03/28/19  13:10
03/30/19  15:29

Laboratory Data
SDG ID: GCC78118
Phoenix ID: CC78119

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
Client ID: EEJC-02

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**PCB (Soxhlet SW3540C)**

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**QA/QC Surrogates**

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Parameters:

RL/PQL Reporting/Practical Quantitation Level ND = Not Detected BRL = Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Results are reported on an "as received" basis, and are not corrected for dry weight.

PCB Comment:
For PCBs, in order to reach the desired RL, multiple cleanup steps were performed. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisil.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
## Analysis Report

April 04, 2019

### Sample Information
- **Matrix:** CAULK
- **Location Code:** LANGAN
- **Rush Request:** Standard
- **P.O. #:**

### Custody Information
- **Collected by:**
- **Received by:** CP
- **Analyzed by:** see "By" below

### Analysis Data

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### QA/QC Surrogates
- **% DCBP**
- **% DCBP (Confirmation)**
- **% TCMX**
- **% TCMX (Confirmation)**

### Other Information
- **Project ID:** #140195502 HSR GOLF COURSE FAIRFIELD CT
- **Client ID:** EEJC-03
- **SDG ID:** GCC78118
- **Phoenix ID:** CC78120

---

**Ver 1**
Parameters and Results Table:

- **Parameter**
- **Result**
- **RL/PQL**
- **Units**
- **Dilution**
- **Date/Time**
- **By**
- **Reference**

**Comments:**

Results are reported on an "as received" basis, and are not corrected for dry weight.

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**Phyllis Shiller, Laboratory Director**

**April 04, 2019**

**Reviewed and Released by: Bobbi Aloisa, Vice President**
Analysis Report
April 04, 2019

FOR:  Atttn: Matt Myers  
Langan Engineering  
555 Long Wharf Drive, 9th Fl  
New Haven, CT 06511

Sample Information
Matrix: CAULK  
Location Code: LANGAN  
Rush Request: Standard  
P.O.#:  

Custody Information
Collected by:  
Received by: CP  
Analyzed by: see "By" below  

Date  Time
03/28/19  13:20
03/30/19  15:29

Laboratory Data
SDG ID: GCC78118  
Phoenix ID: CC78121

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT  
Client ID: EDC-01

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### Comments:

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Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
### Analysis Report

**FOR:** Matt Myers  
Langan Engineering  
555 Long Wharf Drive  9th Fl  
New Haven, CT 06511

**Analysis Date:** April 04, 2019

#### Sample Information
- **Matrix:** CAULK  
- **Location Code:** LANGAN  
- **Rush Request:** Standard  
- **P.O. #:**

#### Custody Information
- **Collected by:**  
- **Received by:** CP  
- **Analyzed by:** see "By" below  
- **Date:** 03/28/19  
- **Time:** 13:30  
- **Date:** 03/30/19  
- **Time:** 15:29

#### Laboratory Data

**SDG ID:** GCC78118  
**Phoenix ID:** CC78122

**Project ID:** #140195502 HSR GOLF COURSE FAIRFIELD CT  
**Client ID:** EDC-02

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RL/PQL=Reporting/Practical Quantitation Level  ND=Not Detected  BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

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PCB Comment:
For PCBs, in order to reach the desired RL, multiple cleanup steps were performed. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florisil.

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Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
## Analysis Report

**April 04, 2019**

**FOR:** Attn: Matt Myers  
Langan Engineering  
555 Long Wharf Drive 9th Fl  
New Haven, CT 06511

### Sample Information
- **Matrix:** CAULK  
- **Location Code:** LANGAN  
- **Rush Request:** Standard  
- **P.O. #:**

### Custody Information
- **Collected by:**  
- **Received by:** CP  
- **Analyzed by:** see "By" below  
- **Date:** 03/28/19  
- **Time:** 13:40  
- **Date:** 03/30/19  
- **Time:** 15:29

### Laboratory Data
- **SDG ID:** GCC78118  
- **Phoenix ID:** CC78123

### Project ID:
- #140195502 HSR GOLF COURSE FAIRFIELD CT

### Client ID:
- EDC-03

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### QA/QC Surrogates

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<td>10</td>
<td>04/03/19</td>
<td>SC</td>
<td>30 - 150 %</td>
</tr>
<tr>
<td>% TCMX</td>
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</tr>
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<td>20</td>
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</table>

3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level  ND=Not Detected  BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an "as received" basis, and are not corrected for dry weight.

PCB Comment:
For PCBs, in order to reach the desired RL, multiple cleanup steps were performed. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional fionsil.

PCB Comment:
For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

April 04, 2019

Reviewed and Released by: Bobbi Aloisa, Vice President
Analysis Report
April 04, 2019

Sample Information
Matrix: CAULK
Location Code: LANGAN
Rush Request: Standard
P.O.:

Custody Information
Collected by: 
Received by: CP
Analyzed by: see “By” below

Date Time
03/28/19 14:00
03/30/19 15:29

Laboratory Data
SDG ID: GCC78118
Phoenix ID: CC78124

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
Client ID: WC-01

Parameter Result RL/ PQL Units Dilution Date/Time By Reference
Caulk Extraction for PCB Completed 04/01/19 XX/XX/XX SW540C

PCB (Soxhlet SW3540C)

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<th>Units</th>
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<th>Date/Time</th>
<th>By</th>
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QA/QC Surrogates

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Comments:

Results are reported on an "as received" basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

April 04, 2019

Reviewed and Released by: Bobbi Aloisa, Vice President
Analysis Report
April 04, 2019

FOR: Attn: Matt Myers
Langan Engineering
555 Long Wharf Drive 9th Fl
New Haven, CT 06511

Sample Information
Matrix: CAULK
Location Code: LANGAN
Rush Request: Standard
P.O.:

Custody Information
Collected by: 
Received by: CP
Analyzed by: see "By" below

Date Time
03/28/19 14:10
03/30/19 15:29

Laboratory Data
SDG ID: GCC78118
Phoenix ID: CC78125

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
Client ID: WC-02

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<td>QA/QC Surrogates</td>
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<tr>
<td>% TCMX (Confirmation)</td>
<td>57</td>
<td>%</td>
<td>5</td>
<td>04/03/19</td>
<td>SC</td>
<td>30 - 150 %</td>
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</table>

Ver 1
Parameter Result RL/PQL Units Dilution Date/Time By Reference

RL/PQL=Reporting/Practical Quantitation Level  ND=Not Detected  BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:
Results are reported on an "as received" basis, and are not corrected for dry weight.

PCB Comment:
For PCBs, in order to reach the desired RL, multiple cleanup steps were performed. The extract was cleaned up with a combination of sulfuric acid, potassium permanganate, copper powder and additional florasil.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
## Analysis Report

April 04, 2019

### Sample Information
- Matrix: CAULK
- Location Code: LANGAN
- Rush Request: Standard
- P.O. #: 

### Custody Information
- Collected by: 
- Received by: CP
- Analyzed by: see "By" below

### Date and Time
- 03/28/19 14:15
- 03/30/19 15:29

### Laboratory Data
- SDG ID: GCC78118
- Phoenix ID: CC78126

#### Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
#### Client ID: WC-03

### Parameter
- Caulk Extraction for PCB

#### Results

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<th>Units</th>
<th>Dilution</th>
<th>Date/Time</th>
<th>By</th>
<th>Reference</th>
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<tbody>
<tr>
<td>PCB (Soxhlet SW3540C)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>ug/Kg</td>
<td>10</td>
<td>04/03/19</td>
<td>SC</td>
<td>SW8082A</td>
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#### QA/QC Surrogates

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<td>04/03/19</td>
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<td>% TCMX</td>
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<td>04/03/19</td>
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</tbody>
</table>
Parameter  Result  RL/ PQL  Units  Dilution  Date/Time  By  Reference

RL/PQL=Reporting/Practical Quantitation Level  ND=Not Detected  BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

Results are reported on an "as received" basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
Analysis Report
April 04, 2019

FOR: Matt Myers
Langan Engineering
555 Long Wharf Dr 9th Fl
New Haven, CT 06511

Sample Information
Matrix: BULK
Location Code: LANGAN
Rush Request: Standard
P.O. #: 

Custody Information
Collected by: 
Received by: CP
Analyzed by: see "By" below

Date
03/28/19
03/30/19

Time
15:00
15:29

Laboratory Data
SDG ID: GCC78118
Phoenix ID: CC78127

Project ID: #140195502 HSR GOLF COURSE FAIRFIELD CT
Client ID: IP-01

Parameter | Result | RL/ PQL | Units | Dilution | Date/Time | By | Reference
---|---|---|---|---|---|---|---
Extraction for PCB | Completed | | | | 04/01/19 | XX/KL/IAK SW3540C |

**PCB (Soxhlet SW3540C)**

PCB-1018
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1221
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1232
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1242
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1248
510 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1254
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1260
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1262
ND 150 ug/Kg 1 04/03/19 SC SW8082A
PCB-1268
ND 150 ug/Kg 1 04/03/19 SC SW8082A

**QA/QC Surrogates**

% DCBP
32 % 1 04/03/19 SC 30 - 150 %
% DCBP (Confirmation)
29 % 1 04/03/19 SC 30 - 150 %
% TCMX
35 % 1 04/03/19 SC 30 - 150 %
% TCMX (Confirmation)
37 % 1 04/03/19 SC 30 - 150 %

Ver 1
Parameters

Parameter | Result | Units | Dilution | Date/Time | By | Reference
---|---|---|---|---|---|---

3 = This parameter exceeds laboratory specified limits.

RL/PQL = Reporting/Practical Quantitation Level  ND = Not Detected  BRL = Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Results are reported on an "as received" basis, and are not corrected for dry weight.

PCB Comment:
Due to matrix interference from non target compounds in the sample, surrogate could not be reported.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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[Signature]
Phyllis Shiller, Laboratory Director
April 04, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President
## QA/QC Data

**SDG I.D.: GCC78118**

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**Comment:**
A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference  
LCS - Laboratory Control Sample  
LCSD - Laboratory Control Sample Duplicate  
MS - Matrix Spike  
MS Dup - Matrix Spike Duplicate  
NC - No Criteria  
Inf - Interference

Phyllis Shiller, Laboratory Director  
April 04, 2019
### Sample Criteria Exceedances Report
#### GCC78118 - LANGAN

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Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.
Analysis Comments
April 04, 2019

SDG I.D.: GCC78118

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report:

**PCB Narration**

AU-ECD3 04/03/19-1: CC78122, CC78123, CC78124, CC78125, CC78126, CC78127

The following Continuing Calibration compounds did not meet % deviation criteria:

Samples: CC78122, CC78123, CC78124, CC78125, CC78126, CC78127

Preceding CC 403A003 - None.
Succeeding CC 403A019 - DCBP SURR 21%L (15%)
Appendix D

Building Drawing
Appendix E

Langan Certifications and Accreditations
STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
ASBESTOS CONSULTANT-PROJECT DESIGNER

CERTIFICATE NO.
000058

CURRENT THROUGH
04/30/19

VALIDATION NO.
03-661926

MATTHEW A. MYERS

SIGNATURE

COMMISSIONER

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
ASBESTOS CONSULTANT-INSPIR/MGMT PLANNER

CERTIFICATE NO.
000041

CURRENT THROUGH
04/30/19

VALIDATION NO.
03-661925

MATTHEW A. MYERS

SIGNATURE

COMMISSIONER

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
ASBESTOS CONSULTANT-PROJECT MONITOR

CERTIFICATE NO.
000077

CURRENT THROUGH
04/30/19

VALIDATION NO.
03-661927

MATTHEW A. MYERS

SIGNATURE

COMMISSIONER
HEREBY CERTIFIES THAT

MATTHEW MYERS

HAS SUCCESSFULLY COMPLETED A TRAINING SEMINAR IN:

NYS/EPA INSPECTOR REFRESHER

MEETING THE REQUIREMENTS OF NYSDOH 10 NYCRR, PART 73 AND TSCA TITLE II AND HAS BEEN AWARDED THIS CERTIFICATE BY:

PAUL A. RODRIGUEZ
TRAINING DIRECTOR

NOTE: Official record of successful completion is DOH 2832 Certificate of Completion of Asbestos Safety Training

NOTE: DOH 2832 - A $20 fee shall be charged for replacement of Certificate of Completion DOH 2832

ON THIS DATE: 9/6/2018

CERTIFICATE NUMBER: 816230

EXPIRATION DATE: 9/6/2019
CERTIFICATE OF ACHIEVEMENT

This certifies that

James Raffin

has successfully completed the

4 Hour Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

Conducted by
ATC Group Services LLC
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

Principle Instructor: Marcus Souza

January 17, 2019
Date of Course

January 17, 2019
Expiration Date

Regional Training Manager: Gregory Martin
Certificate Number: STAR-0198
Issuance Date: January 17, 2019
STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
LEAD INSPECTOR

BRIAN D QUINLAN
CERTIFICATE NO. 002240
CURRENT THROUGH 07/31/19
VALIDATION NO. 03-691542

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
ASBESTOS CONSULTANT-PROJECT MONITOR

BRIAN D QUINLAN
CERTIFICATE NO. 000783
CURRENT THROUGH 07/31/19
VALIDATION NO. 03-691541

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A
ASBESTOS CONSULTANT-INSPECTOR

BRIAN D QUINLAN
CERTIFICATE NO. 000921
CURRENT THROUGH 07/31/19
VALIDATION NO. 03-690587
ATC GROUP SERVICES LLC
104 East 25th Street, New York, NY 10010
(212) 353-8280

Brian D. Quinlan

Has Successfully Completed the Accredited 4 Hour EPA-AHERA/ASHARA under 40 CFR 763 and the New York State Department of Health Approved Course for

Asbestos Inspector Refresher

On

January 29, 2019

** Please note that the official record of successful completion is the DOH 2832 Certificate of Asbestos Safety Training. **

This course meets the requirements of TSCA Title II

Certificate#: NYS -RHIIR-22075
Exam date: 01-29-19
Expiration Date: 01-29-20

Course Location: 21 West 38th Street, New York, NY

Signed: [Signature]
Fitzroy N. Scott, Director of Training
CERT#: L-500-256

CHEMSCOPE TRAINING DIVISION

LEAD INSPECTOR REFRESHER

8HOUR TRAINING CERTIFICATE

Brian D. Quinlan

3 Glen Haven Road, East Haven CT

Has attended an 8 hour course on the subject discipline in English on
1/10/2019 and has passed a written examination.

The above individual has successfully completed the above training course approved in accordance with the Department of Public Health Standards established pursuant to Section 20-477 of the Connecticut General Statutes.

Course syllabus includes all required topics of State of Connecticut DPH and EPA.

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (U.S.C. 1001 and 15 U.S. C. 2615), I certify that this training complies with all applicable requirements of Title IV of TSCA, 40 CFR part 745 and any other applicable Federal, State or local requirements.

Examination Score: 90%
Exam Date: 1/10/2019
Expiration Date: 1/10/2020

Ronald D. Arena
Training Manager

Chem Scope, Inc.
15 Moulthrop Street
North Haven CT 06473
Phone: 203.865.5605
www.chem-scope.com
SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.

B. Related Sections:

1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: Blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. Shop drawings will not be accepted for review by the Engineer unless there is substantial evidence that the General Contractor or Construction manager on the project has reviewed the submittal for compliance with the contract documents and has addressed questions to be responded to by the Contractor. All coordination items with other trades and submittals are to be performed and the submittal marked accordingly before submission. Failure to provide the above will result in the submittal being returned and not reviewed.
2. Contractor shall perform review and schedule shop drawing submittals to permit a minimum of fifteen (15) calendar days for review by the Engineer. Shop Drawings will be returned to the Architect for their required review and processing.

3. Shop drawings will not be reviewed unless accompanied by erection drawings which locates and identifies the members. Copies or reproductions of contract drawings will not be accepted or reviewed as shop drawings.

4. Shop drawings shall be submitted in the form of electronic (PDF) files.

5. The following is the definitions for the Shop Drawing stamp disposition:
   a. No Exceptions Taken - Re-submission is not required unless document is revised.
   b. Make Corrections Noted - If checked, fabrication may be undertaken. Contractor is responsible for making noted corrections. Re-submission of record copies are required.
   c. Revise and Resubmit - If checked, fabrication may not be undertaken. Resubmit corrected copies for final review, with all changes clouded.
   d. Rejected - Resubmit for review.

Corrections or comments made on shop drawings during this review do not relieve the Contractor from compliance with the requirements of the project drawings and specifications. This check is only for the review of general conformance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes, techniques and sequence of construction, coordinating his work with that of other trades, and performing his work in accordance with OSHA requirements and other sections of the Project Specifications.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

E. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Curing compounds.
5. Floor and slab treatments.
7. Adhesives.
8. Vapor retarders.

F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

G. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
H. Field quality-control reports.

I. Minutes of pre-installation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete for Buildings."
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Preinstallation Conference: Conduct conference at Project site.
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Concrete subcontractor.
      e. Special concrete finish subcontractor.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
   a. High-density overlay, Class 1 or better.
   b. Medium-density overlay, Class 1 or better; mill-release agent treated, and edge sealed.
   c. Structural 1, B-B or better; mill oiled and edge sealed.
   d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.


D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodable metal closer than 1-inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1-inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

C. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884, Class A coated, Type 1, plain steel.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Epoxy-Coated Joint Dowel Bars: ASTM A 615, Grade 60, plain-steel bars, ASTM A 775 epoxy coated.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150 Type I/II, gray. Supplement with the following:

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94 and potable.

2.5 ADMIXTURES

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Retarding Admixture: ASTM C 494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

C. Moisture Vapor Reducing Admixture (MVRA):

1. Concrete moisture proofing admixture for interior slab construction shall be one (1) of the following:
   a. Barrier-1 Inc.
   b. Moxie International
   c. Vapor Lock 20/20

2. Product Description: Waterproofing admixture is a sodium silicate-based, complex formula that is free of all volatile organic compounds (VOC). It is specifically designed to have a natural chemical reaction with pre-existing elements inside the concrete to eliminate the route of moisture vapor emission through concrete by closing down the integral capillary system. The chemical reaction forms a permanent barrier (capillary break) which will become integral to the concrete and irremovable.
   a. Water Vapor Transmission: 0.20 US perms per ASTM D 5084.
   b. Appearance: Colorless.
   c. Odor: None.
   d. Toxicity: None.
   e. Flammability: None.
   f. Ph: 11.3.
   g. Shelf Life: Indefinite.
   h. Weight: 11.2 lbs per gallon.
   i. Freeze Temp: 32°F.
   j. Storage Temp: Above 36°F.
   k. Solvent: Water.
   l. Acid Resistance: Excellent.
   m. Hazardous Vapors: None.
   n. Capillary Break: Calcium Silicate Hydrate.
   o. Installation: Where indicated.
   p. VOC Levels: Zero.

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Stego Industries, LLC; Stego Wrap 15 mil Class A
   b. Fortifiber Building Systems Group; Moistop Ultra 15
   c. Grace Construction Products, W. R. Grace & Co.; Florprufe 120
   d. Raven Industries Inc.; Vapor Block 15
   e. Viper II; 15 mil Class A

2.7 CURING MATERIALS

   A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

   B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

   C. Water: Potable.

2.8 RELATED MATERIALS


   B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

   C. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

2.9 CONCRETE MIXTURES, GENERAL

   A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

      1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

   B. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

   C. Admixtures: Use admixtures according to manufacturer's written instructions.

      1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.

      2. Use water reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

      3. Use water-reducing admixture in pumped concrete, and concrete with a water-cementitious materials ratio below 0.50.

      4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

   D. Moisture Vapor Reducing Admixture (MVRA): Add waterproofing admixture in accordance with manufacturer’s recommendations to all ready-mix concrete to be placed in interior slab–
on-grade, interior elevated slab construction, vertical cast in place, precast and tilt wall at the batch plant or at the job site.

1. A representative or agent must be present at the jobsite during the placement of treated concrete. Do not proceed without the representative being present for the certification of the mix and placement process. Provide minimum ten (10) days notice of the placement of the first batch of treated concrete.

2. Dispense at a rate of per 100 lbs. of cementitious materials per the manufacturer’s recommendations at the tail end of the load, dose to be within plus or minus three percent (+/-3%). Additional dosage may be required based on the mix design.
   a. Add Admixture to ready mix concrete truck, in the require dosage, and mix for 7 minutes before discharge. Moisture vapor reducing admixture is to be used in lieu of designed mix water, not in addition to mix water.
   b. Do not alter 0.50 water/cementitious materials ratio without prior approval.
   c. The addition of non-chlorinated admixtures is permitted.

3. Other admixtures may be used in the same concrete batch with moisture vapor reducing admixture provided that such admixtures are added separately.

4. The water-to-cementitious material ratio (w/cm) is critical and it is imperative to comply with the mix design. Moisture vapor reducing admixture is used in lieu of that portion of the mix water, not in addition to the mix water.

5. Use of plasticizers or water reducers is recommended to achieve slumps greater than 4 inches.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings and Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi at twenty-eight (28) days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1-inch.
4. Air Content: Six percent (6%), plus or minus one and one-half percent (+/- 1.5%) at point of delivery for ¾-inch nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi at twenty-eight (28) days.
3. Maximum Water-Cementitious Materials Ratio: 0.50.
4. Slump Limit: 4 inches, plus or minus 1-inch.
5. Air Content: Do not allow air content of trowel-finished floors to exceed three percent (3%).
6. Provide moisture vapor reducing admixture in the concrete mix. Dosage rate shall be in accordance with the manufacturer’s recommendations.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

2. Class B, ¼-inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Do not chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Foundation Wall Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1½ inches into concrete.

3. Space vertical joints in walls 30 feet maximum. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth depth of concrete thickness slabs for typical slabs and a maximum of 1-inch for with embedded piping for radiant heat:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than ½-inch or more than 1-inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one (1) length is required, lace or clip sections together.

E. Doweled Joints: Install diamond dowel and support assemblies at joints where indicated.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one (1) day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of ¼-inch in one (1) direction.

1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.

2. Finish surfaces to the following tolerances, according to ASTM E 1155:
   a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-foot-long straightedge resting on two (2) high spots and placed anywhere on the surface does not exceed 3/16-inch.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

   1. Moisture Curing: Keep surfaces continuously moist for not less than seven (7) days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven (7) days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
      b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
      c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

   1. Defer joint filling until concrete has aged at least 1 month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1-part Portland cement to 2½-parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than ½-inch in any dimension to solid concrete. Limit cut depth to ¼-inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch-wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least fourteen (14) days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

1. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

2. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of ¼-inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
3. Repair defective areas, except random cracks and single holes 1-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a ¾-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

4. Repair random cracks and single holes 1-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one (1) composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one (1) set for each additional 100 cu. yd. or fraction thereof.

   a. When frequency of testing will provide fewer than five (5) compressive-strength tests for each concrete mixture, testing shall be conducted from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.

2. Slump: ASTM C 143; one (1) test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064; one (1) test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one (1) test for each composite sample.

5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.

6. When strength of field-cured cylinders is less than eighty-five percent (85%) of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

7. Strength of each concrete mixture will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty-eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

END OF SECTION 033000
SECTION 034500 - PRECAST ARCHITECTURAL CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Architectural precast concrete chimney cap.

1.3 DEFINITIONS

A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.

C. Shop Drawings:

1. Detail fabrication and installation of architectural precast concrete units.
2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
4. Indicate details at building corners.
5. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
6. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
7. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
8. Indicate relationship of architectural precast concrete units to adjacent materials.

D. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three (3), representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.

1. When other faces of precast concrete unit are exposed, include Samples illustrating workmanship, color, and texture of backup concrete as well as facing concrete.
1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and fabricator.
B. Welding certificates.
C. Material Certificates: For the following items:
   1. Cementitious materials.
   2. Reinforcing materials.
   3. Admixtures.
D. Material Test Reports: For aggregates.
E. Source quality-control test reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A precast concrete erector who has retained a "PCI-Certified Field Auditor" to conduct a field audit of a project in same category as this Project and who can produce an Erectors' Post-Audit Declaration.
B. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."

1.7 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.
B. Support units during shipment on non-staining shock-absorbing material.
C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
D. Place stored units so identification marks are clearly visible, and units can be inspected.
E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.

F. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.

B. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:

1. Loads: As indicated on the Drawings and as required per Building Code.
2. Thermal Movements: Provide for in-plane thermal movements resulting from annual ambient temperature changes of 80 deg F (26 deg C).

2.2 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars, Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240, ASTM A 276, or ASTM A 666, Type 304.

B. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place according to PCI MNL 117.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.

1. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source.

B. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.

2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.

C. Coloring Admixture: ASTM C 979, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.
   1. Color as selected by Architect and Owner from manufacturer’s full range.

D. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.

E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

2.5 MORTAR MATERIALS

A. Provide mortar materials that comply with Section 042613 “Masonry Veneer”.

2.6 ACCESSORIES

A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install architectural precast concrete units.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.
   1. Use a single design mixture for units with more than one (1) major face or edge exposed.
   2. Where only one (1) face of unit is exposed use either a single design mixture or separate mixtures for face and backup.

B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.

C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 117 when tested according to ASTM C 1218.

D. Normal-Weight Concrete Mixtures: Proportion full-depth mixture by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
   2. Maximum Water-Cementitious Materials Ratio: 0.45.

E. Water Absorption: Six percent (6%) by weight or fourteen percent (14%) by volume, tested according to ASTM C 642, except for boiling requirement.
F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.

2.8 MORTAR MIXES
A. Comply with requirements in Section 042613 “Masonry Veneer” for mortar mixes.

2.9 MOLD FABRICATION
A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement by release agent.

B. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
   1. Form joints are not permitted on faces exposed to view in the finished work.
   2. Edge and Corner Treatment: Uniformly chamfered or as indicated in Drawings.

2.10 FABRICATION
A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.

C. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.
   1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete.
   2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
   3. Place reinforcing steel to maintain at least ¾-inch minimum concrete cover. Increase cover requirements for reinforcing steel to 1½ inches when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.

D. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
E. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

F. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.

G. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.

H. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.

I. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.

J. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

K. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

2.11 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

2.12 FINISHES

A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved design reference sample and as follows:

1. As-Cast Surface Finish: Provide surfaces to match approved sample for acceptable surface, air voids, sand streaks, and honeycomb.

B. Finish exposed top, bottom and back surfaces of architectural precast concrete units to match face-surface finish.

C. Finish unexposed surfaces of architectural precast concrete units with as cast finish.

2.13 SOURCE QUALITY CONTROL

A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements.
B. Strength of precast concrete units is considered deficient if units fail to comply with ACI 318 requirements for concrete strength.

C. Testing: If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, precaster will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42 and ACI 318.

1. A minimum of three (3) representative cores shall be taken from units of suspect strength, from locations directed by Architect.
2. Test cores in an air-dry condition.
3. Strength of concrete for each series of three (3) cores is considered satisfactory if average compressive strength is equal to at least eighty-five percent (85%) of twenty-eight (28) day design compressive strength and no single core is less than seventy-five percent (75%) of twenty-eight (28) day design compressive strength.
4. Report test results in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports include the following:
   a. Project identification name and number.
   b. Date when tests were performed.
   c. Name of precast concrete fabricator.
   d. Name of concrete testing agency.
   e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.

D. Patching: If core test results are satisfactory and precast concrete units comply with requirements, clean and dampen core holes and solidly fill with precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.

E. Defective Units: Discard and replace recast architectural concrete units that do not comply with acceptability requirements in PCI MNL 117, including concrete strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 SETTING IN MORTAR

A. Set architectural precast concrete units as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
   1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
   2. Coordinate installation of units with installation of flashing specified in other Sections.

B. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

C. Set units in full bed of mortar with full head joints unless otherwise indicated.
   1. Set units with joints ¼- to 3/8-inch-wide unless otherwise indicated.
   2. Build anchors and ties into mortar joints as units are set.
   3. Fill dowel holes and anchor slots with mortar.
   4. Build concealed flashing into mortar joints as units are set.
   5. Keep joints at shelf angles open to receive sealant.

D. Rake out joints for pointing with mortar to depths of not less than ¾-inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

E. Point mortar joints by placing and compacting mortar in layers not greater than 3/8-inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

F. Tool exposed joints when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.

G. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
   1. Keep joints free of mortar and other rigid materials.
   2. Build in compressible foam-plastic joint fillers where indicated.
   3. Form joint of width indicated, but not less than 3/8-inch.
   4. Prime precast surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
   5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 MECHANICALLY INSTALLING

A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.

B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
1. Install temporary steel or plastic spacing shims as precast concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
3. Remove projecting lifting devices and grout fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
4. Unless otherwise indicated, maintain uniform joint widths of ¾-inch.

C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

1. Do not permit connections to disrupt continuity of roof flashing.

3.4 ERECTION TOLERANCES
A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.

3.5 REPAIRS
A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.
C. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.6 CLEANING
A. Clean surfaces of precast concrete units exposed to view.
B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.

1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034500
SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Concrete masonry units.
   2. Firebox brick.
   3. Clay flue lining units.
   4. Mortar and grout.
   5. Steel reinforcing bars.
   7. Embedded flashing.
   8. Miscellaneous masonry accessories.

B. Related Requirements:
   1. Section 033000 "Cast-in-Place Concrete" for dovetail slots for masonry anchors.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

A. Refer to Section 047300 “Manufactured Masonry Veneer”.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:
   1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
   2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.
B. Material Certificates: For each type and size of the following:

1. Masonry units.
   a. Include material test reports substantiating compliance with requirements.

2. Cementitious materials. Include name of manufacturer, brand name, and type.

3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

4. Grout mixes. Include description of type and proportions of ingredients.

5. Reinforcing bars.


7. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109 for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.

2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 042613 “Masonry Veneer”.

B. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

1.9 FIELD CONDITIONS

A. Refer to Section 047300 “Manufactured Masonry Veneer”.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three (3) days after building masonry walls or columns.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.3 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for outside corners unless otherwise indicated.

B. CMUs: ASTM C 90.

1. Density Classification: Normal weight.
2. Size (Width): Manufactured to dimensions 3/8-inch less-than-nominal dimensions.
3. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.4 MASONRY LINTELS

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.5 FIREPLACE AND CHIMNEY LINING UNITS

A. Firebox Brick: ASTM C 1261, size required to produce lining thickness indicated.

B. Clay Flue Lining Units: ASTM C 315.

2.6 MORTAR AND GROUT MATERIALS

A. Refer to Section 047300 “Manufactured Masonry Veneer”.

H. Smith Richardson Golf Course Clubhouse – Fairfield
042200-3
B. Aggregate for Grout: ASTM C 404.

C. Refractory Mortar Mix: Ground fireclay or non-water-soluble, calcium aluminate, medium-duty refractory mortar that passes ASTM C 199 test; or an equivalent product acceptable to authorities having jurisdiction.

2.7 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615 or ASTM A 996, Grade 60.

B. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A 951.

1. Exterior Walls: Stainless-steel.
2. Wire Size for Side Rods: 0.148-inch diameter.
4. Spacing of Cross Rods: Not more than 16 inches o.c.
5. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

2.8 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1½ inches into masonry but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Stainless-Steel Wire: ASTM A 580, Type 304.
2. Stainless-Steel Sheet: ASTM A 240 or ASTM A 666, Type 304.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

B. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.10 MORTAR AND GROUT MIXES

A. Refer to Section 047300 “Manufactured Masonry Veneer”.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.

1. For masonry below grade or in contact with earth, use Type S.
2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
5. For interior non-load-bearing partitions, Type O may be used instead of Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
   2. Proportion grout in accordance with ASTM C 476, Table 1.
   3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
      1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
      2. Verify that foundations are within tolerances specified.
      3. Verify that reinforcing dowels are properly placed.
      4. Verify that substrates are free of substances that would impair mortar bond.
   B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
   C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL
   A. Build chases and recesses to accommodate items specified in this and other Sections.
   B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
   C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES
   A. Dimensions and Locations of Elements:
      1. For dimensions in cross section or elevation, do not vary by more than plus ½-inch or minus ¼-inch.
      2. For location of elements in plan, do not vary from that indicated by more than plus or minus ½-inch.
      3. For location of elements in elevation, do not vary from that indicated by more than plus or minus ¼-inch in a story height or ½-inch total.
B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than $\frac{1}{4}$-inch in 10 feet, or $\frac{1}{2}$-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than $\frac{1}{8}$-inch in 10 feet, $\frac{1}{4}$-inch in 20 feet, or $\frac{1}{2}$-inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than $\frac{1}{4}$-inch in 10 feet, $\frac{3}{8}$-inch in 20 feet, or $\frac{1}{2}$-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than $\frac{1}{8}$-inch in 10 feet, $\frac{1}{4}$-inch in 20 feet, or $\frac{1}{2}$-inch maximum.
5. For lines and surfaces do not vary from straight by more than $\frac{1}{4}$-inch in 10 feet, $\frac{3}{8}$-inch in 20 feet, or $\frac{1}{2}$-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than $\frac{1}{4}$-inch in 10 feet, or $\frac{1}{2}$-inch maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus $\frac{1}{8}$-inch, with a maximum thickness limited to $\frac{1}{2}$-inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than $\frac{1}{8}$-inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus $\frac{3}{8}$-inch or minus $\frac{1}{4}$-inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus $\frac{1}{8}$-inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than $\frac{1}{8}$-inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:
   1. Bed face shells in mortar and make head joints of depth equal to bed joints.
   2. Bed webs in mortar in all courses of piers, columns, and pilasters.
   3. Bed webs in mortar in grouted masonry, including starting course on footings.
   4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set firebox brick in full bed of refractory mortar with full head joints. Form joints by buttering both surfaces of adjoining brick and sliding it into place. Make joints just wide enough to accommodate variations in size of brick, approximately 1/8-inch. Tool joints smooth on surfaces exposed to fire or smoke.

D. Install clay flue liners to comply with ASTM C 1283. Install flue liners ahead of surrounding masonry. Set clay flue liners in full bed of refractory mortar 1/16- to 1/8-inch-thick. Strike joints flush on inside of flue to provide smooth surface. Maintain expansion space between flue liner and surrounding masonry except where surrounding masonry is required to provide lateral support for flue liners.

E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

F. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, ½ inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.
E. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:
   1. Install preformed control-joint gaskets designed to fit standard sash block.

3.8 LINTELS

A. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.9 REINFORCED UNIT MASONRY INSTALLATION

A. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.
   1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
   2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
   3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Frequency: One (1) set of tests for each 5000-sq. ft. of wall area or portion thereof.

D. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
E. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.11 PARGING

A. Parge faces of concrete or masonry walls, where indicated, in two (2) uniform coats to a total thickness of ¾-inch. Dampen wall before applying first coat and scarify first coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8-inch per foot. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.12 CLEANING

A. Refer to 047300 “Manufactured Masonry Veneer”.

3.13 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
SECTION 047300 - MANUFACTURED MASONRY VENEER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Portland cement-based manufactured stone veneer and trim.
      2. Stone flue cap.
   B. Related Sections:
      1. Section 034500 "Precast Architectural Concrete."
      2. Section 042200 "Concrete Unit Masonry" for substrate.

1.3 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. For stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   B. Samples:
      1. Standard board consisting of small-scale pieces of veneer units showing full range of textures and colors.
      2. For colored mortar, make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.

1.5 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For manufacturer and installer.
   B. Material Test Reports:
      1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, other than abrasion resistance, according to referenced ASTM standards. Base reports on testing done within previous five (5) years.
C. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109 for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.

D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of stone units similar to those indicated for this Project that has sufficient production capacity to manufacture required units.

B. Installer Qualifications: Experienced mason familiar with installation procedures and related local, state and federal codes.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of typical wall area, including corner as shown on Drawings.
2. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.

b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of stone with unit masonry work to avoid delaying the Work and to minimize the need for on-site storage.

B. Pack, handle, and ship stone units in suitable packs or pallets.

1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone units if required, using dollies with wood supports.

2. Store stone units on wood skids or pallets with non-staining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

E. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, in a dry location, or in covered weatherproof dispensing silos.

F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Stain Prevention: Immediately remove grout, mortar and soil to prevent them from staining stone masonry face.
   1. Protect base of walls from rain-splashed mud and mortar splatter using coverings spread on the ground and over the wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until cast stone has dried, but no fewer than seven (7) days after completing cleaning.


1.9 WARRANTY

A. Special Warranty: Manufacturer’s standard warranty coverage against defects in materials when installed in accordance with manufacturer’s installation instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Stone: Obtain stone units from single source from single manufacturer.
B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one (1) manufacturer for each cementitious component and from one (1) source or producer for each aggregate.

2.2 MANUFACTURED STONE VENEER

A. Basis-of-Design:

1. Eldorado Stone, LLC
2. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Material Standards:

2. Shear Bond: ASTM C 482, 50 psi, minimum.
3. Freeze-Thaw Test: ASTM C 67, less than three percent (<3%) weight loss and no disintegration.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 1329; natural color or white cement may be used as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in stone masonry mortar.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Davis Colors; True Tone Mortar Colors
   b. Lanxess Corporation; Bayferrox Iron Oxide Pigments
   c. Solomon Colors, Inc.; SGS Mortar Colors
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

D. Aggregate: ASTM C 144 and as follows:

1. White Aggregates: Natural white sand or ground white stone.
2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

E. Water: Potable.

2.4 STONE FLUE CAP

A. Slate: Comply with ASTM C 629. Classification I Exterior.

B. Description: Slate with a fine, even grain and unfading color, from clear, sound stock in color as selected by Architect and Owner from available sources.
MANUFACTURED MASONRY VENEER

C. Finish: Natural cleft.

D. Thickness: As indicated in Drawings.

2.5 ACCESSORIES

A. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A240, ASTM A276, or ASTM A666, Type 304.

2.6 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride.
   2. Use Portland cement-lime mortar unless otherwise indicated.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

   1. Mortar for Setting Stone: Type S for stone below grade or in contact with the earth, otherwise Type N.

D. Pigmented Mortar: Use colored cement product.

E. Mortar Color: As selected by Architect and Owner from manufacturer’s full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed ¼ inch in 10 feet, 3/8 inch in 20 feet, or ½ inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed ¼ inch in 20 feet or ½ inch in 40 feet or more.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed ¼ inch in 20 feet or ½ inch in 40 feet or more.
C. Measure variation from level, plumb, and position shown in plan as a variation of the average plane of each stone face from level, plumb, or dimensioned plane.

D. Variation in Mortar-Joint Thickness: Do not vary from joint size range indicated.

3.3 SETTING STONE IN MORTAR

A. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

B. Set stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.

C. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

D. Set units in full bed of mortar with full head joints unless otherwise indicated.
   1. Set units with joints ¼-to-3/8-inch wide unless otherwise indicated.

3.4 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples.

B. Replace units in a manner that results in stone matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean stone as work progresses.
   1. Remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed stone as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample; leave one (1) sample uncleansed for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of stone.
   3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
   4. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

END OF SECTION 047300
SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Structural steel.
   2. Grout.

B. Related Sections:
   1. Section 014000 "Quality Requirements" for independent testing agency procedures and administrative requirements.

1.3 DEFINITIONS

A. Structural Steel:  Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 PERFORMANCE REQUIREMENTS

A. Connections:  Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

   1. Select and complete connections using schematic details indicated and AISC 360.
   2. Use ASD; data are given at service-load level.

B. Moment Connections:  Type FR, fully restrained.

C. Construction: Combined system of moment frame, braced frame, and shear walls.

1.5 SUBMITTALS

A. Product Data:  For each type of product indicated.

B. Shop Drawings:  Show fabrication of structural-steel components.

   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.

4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

5. Identify members and connections of the seismic-load-resisting system.

6. Indicate locations and dimensions of protected zones.

7. For structural-steel connections indicated to comply with design loads, include structural design data signed and sealed by the qualified professional engineer responsible for their preparation.

8. Submit shop drawings of all members to be furnished. Detail drawings of the members and their connections shall follow standard practice as set forth in the AISC "Manual of Structural Steel Detailing" (Second Edition). In particular, welding shall be shown, using standard AWS welding symbols. Show on detail drawings the paint to be used.

9. Shop drawings will not be accepted for review by the Engineer unless there is substantial evidence that the General Contractor or Construction manager on the project has reviewed the submittal for compliance with the contract documents and has addressed questions to be responded to by the Contractor. All coordination items with other trades and submittals are to be performed and the submittal marked accordingly before submission. Failure to provide the above will result in the submittal being returned and not reviewed.

10. Contractor shall perform review and schedule shop drawing submittals to permit a minimum of fifteen (15) calendar days for review by the Engineer. Shop Drawings will be returned to the Architect for their required review and processing.

11. Shop drawings will not be reviewed unless accompanied by erection drawings which locates and identifies the members. Copies or reproductions of contract drawings will not be accepted or reviewed as shop drawings.

12. Shop drawings shall be submitted in the form of electronic (PDF) files.

13. The following is the definitions for the Shop Drawing stamp disposition:

   a. No Exceptions Taken - Re-submission is not required unless document is revised.

   b. Make Corrections Noted - If checked, fabrication may be undertaken. Contractor is responsible for making noted corrections. Re-submission of record copies are required.

   c. Revise and Resubmit - If checked, fabrication may not be undertaken. Resubmit corrected copies for final review, with all changes clouded.

   d. Rejected - Resubmit for review.

Corrections or comments made on shop drawings during this review do not relieve the Contractor from compliance with the requirements of the project drawings and specifications. This check is only for the review of general conformance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes, techniques and sequence of construction, coordinating his work with that of other trades, and performing his work in accordance with OSHA requirements and other sections of the Project Specifications.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

D. Qualification Data: For qualified Installer and fabricator. Welding certificates.

E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

F. Mill test reports for structural steel, including chemical and physical properties.

G. Product Test Reports: For the following:
   1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   2. Direct-tension indicators.
   3. Tension-control, high-strength bolt-nut-washer assemblies.
   4. Shear stud connectors.
   5. Shop primers.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."
   1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

D. Comply with applicable provisions of the following specifications and documents:
   1. AISC 303.
   2. AISC 341 and AISC 341s1.
   3. AISC 360.
   4. RCSC’s "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
   1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
   2. Clean and relubricate bolts and nuts that become dry or rusty before use.
   3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

C. Tolerances: Structural steel fabricator shall coordinate with the requirements for tolerances as required by the selected building finish systems, and to construct to those tolerances if they are stricter than the AISC standards.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992.

B. Channels, Angles: ASTM A 36.

C. Plate and Bar: ASTM A 36.

D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade C, structural tubing.

E. Steel Pipe: ASTM A 53, Type E or S, Grade B.
   1. Finish: Black except where indicated to be galvanized.

F. Steel Castings: ASTM A 216, Grade WCB with supplementary requirement S11.

G. Steel Forgings: ASTM A 668.

H. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers with plain finish.

C. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
   4. Washers: ASTM F 436, Type 1, hardened carbon steel.
   5. Finish: Plain.

   3. Finish: Plain.

2.3 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

   1. Camber structural-steel members where indicated.
   2. Fabricate beams with rolling camber up.
   3. Identify high-strength structural steel according to ASTM A 6 and maintain markings until structural steel has been erected.
   4. Mark and match-mark materials for field assembly.
   5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Slip critical.

B. Weld Connections: Comply with AWS D1.1 and AWS D1.8 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.
   1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
   2. Galvanize lintels shelf angles and welded door frames attached to structural-steel frame and located in exterior walls.

2.8 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
   1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges." Level and plumb individual members of structure within specified AISC tolerances, unless stricter tolerances are otherwise required by finish building systems being provided on the project. Contractor is responsible to coordinate all construction tolerances, and to construct to the tolerances as required with all the selected building finish systems supported by or adjacent to the structural steel.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated if noted in contract documents.

F. Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened or Slip critical.

B. Weld Connections: Comply with AWS D1.1 and AWS D1.8 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.
   1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:
      a. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
      b. Ultrasonic Inspection: ASTM E 164.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:
   1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
   2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 051200
SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Steel framing and supports for mechanical and electrical equipment.
      2. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.3 COORDINATION
   A. Coordinate installation of metal fabrications that are anchored to or that receive other work. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS
   A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
      1. Steel framing and supports for mechanical and electrical equipment.
      2. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.5 INFORMATIONAL SUBMITTALS
   A. Welding certificates.
   B. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE
   A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

1.7 FIELD CONDITIONS
   A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36.

C. Steel Tubing: ASTM A 500, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53, Standard Weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six (6) times the load imposed when installed in unit masonry and four (4) times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

F. Post-Installed Anchors: Torque-controlled expansion anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
C. Galvanize and prime miscellaneous framing and supports where indicated, unless stainless-steel.

2.7 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two (2) integrally welded steel strap anchors for embedding in concrete.

2.8 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153 for steel and iron hardware and with ASTM A 123 for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for
use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Rooftop equipment bases and support curbs.
4. Wood blocking, cants, and nailers.
5. Wood furring and grounds.
6. Plywood backing panels.

B. Related Requirements:

1. Section 061753 "Shop-Fabricated Wood Trusses" for roof trusses.

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

2. NLGA: National Lumber Grades Authority.
4. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:
   1. Wood-preservative-treated wood.
   2. Engineered wood products.
   5. Expansion anchors.
   6. Metal framing anchors.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
   3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: Nineteen percent (19%) unless otherwise indicated.

C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

   1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of nineteen percent (19%). Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.
   3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
   4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
   5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

   1. Species:
      a. Hem-fir (north); NLGA.
      b. Douglas fir-larch; WCLIB or WWPA.

2.4 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.

B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

C. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
   a. Boise Cascade Corporation
   b. Georgia-Pacific
   c. Louisiana-Pacific Corporation
   d. Roseburg Forest Products Co.
   e. Weyerhaeuser Company

2. Extreme Fiber Stress in Bending, Edgewise: 2600 psi for 12-inch nominal depth members.

3. Modulus of Elasticity, Edgewise: 2,000,000 psi.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.

B. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of any of the following species:
   1. Hem-fir (north); NLGA.
   2. Hem-fir; WCLIB or WWPA.
   3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than ¾-inch nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

B. Nails, Brads, and Staples: ASTM F 1667.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six (6) times the load imposed when installed in unit masonry assemblies and equal to four (4) times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.


2.8 METAL FRAMING ANCHORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one (1) of the following:

1. Simpson Strong-Tie Co., Inc.
2. USP Structural Connectors
3. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

D. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1¼-inch wide nailing flanges at least eighty-five percent (85%) of joist depth.

E. Bridging: Rigid, V-section, nailless type, 0.050-inch-thick, length to suit joist size and spacing.

F. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2½ inches wide by 0.062-inch-thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.
PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking and similar supports to comply with requirements for attaching other construction.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.

K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 CEILING JOIST AND RAFTER FRAMING INSTALLATION

**A. Ceiling Joists:** Install ceiling joists with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal size or 2-by-4-inch nominal size stringers spaced 48 inches o.c. crosswise over main ceiling joists.

**B. Rafters:** Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

### 3.3 WOOD BLOCKING AND NAILER INSTALLATION

**A.** Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

**B.** Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.4 STAIR FRAMING INSTALLATION

**A.** Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:

1. Size: 2-by-12-inch nominal-size, minimum.
3. Notching: Notch rough carriages to receive treads, risers, and supports; leave at least 3½ inches of effective depth.
4. Spacing: At least three (3) framing members for each 36-inch clear width of stair.

**B.** Provide stair framing with no more than 3/16-inch variation between adjacent treads and risers and no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

END OF SECTION 061000
SECTION 061323 - HEAVY TIMBER CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes framing using timbers.

B. Related Sections:
   1. Section 061000 "Rough Carpentry" for dimension lumber items associated with heavy timber construction.
   2. Section 061500 "Structural Wood Decking" for wood roof decking.

1.3 DEFINITIONS

A. Timbers: Lumber of 5 inches nominal or greater in least dimension.

B. Inspection agencies, and the abbreviations used to reference them, include the following:
   2. NHLA - National Hardwood Lumber Association.
   3. NLGA - National Lumber Grades Authority.
   4. WWPA - Western Wood Products Association.

1.4 SUBMITTALS

A. Product Data: For timber connectors.
   1. For preservative-treated wood products, include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
   2. For timber connectors, include installation instructions.

B. Shop Drawings: For heavy timber construction. Show layout, dimensions of each member, and details of connections.

C. Material Certificates:
   1. For heavy timber construction specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by ALSC's Board of Review.

D. Certificates of Inspection: Issued by lumber grading agency for exposed timber not marked with grade stamp.
1.5 QUALITY ASSURANCE


B. Forest Certification: Provide wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of heavy timber construction to avoid extended on-site storage and to avoid delaying the Work.

B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.1 TIMBER

A. General: Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC's Board of Review as applicable.

1. Factory mark each item of timber with grade stamp of grading agency.
2. For exposed timber indicated to receive a stained or natural finish, apply grade stamps to surfaces that will not be exposed to view, or omit grade stamps and provide certificates of grade compliance issued by grading agency.

B. Timber Species and Grade: No. 1, NeLMA, NLGA, SPIB, WCLIB, or WWPA.

C. Moisture Content: Provide timber with nineteen percent (19%) maximum moisture content at time of dressing.

D. Dressing: Provide dressed timber (S4S) unless otherwise indicated.

E. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

F. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.2 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011, Structural Steel, Type SS, Grade 33.
B. Fabricate beam seats from steel with 3/8-inch bearing plates, and 0.239-inch side plates.

C. Fabricate beam hangers from steel with 0.179-inch stirrups and 0.239-inch top plates.

D. Fabricate tie rods from round steel bars with upset threads connected with forged-steel turnbuckles complying with ASTM A 668.

E. Provide bolts, ¾-inch unless otherwise indicated, complying with ASTM A 307, Grade A; provide nuts complying with ASTM A 563; and, where indicated, provide flat washers.

F. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil dry film thickness.

G. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123 or ASTM A 153.

2.3 FABRICATION

A. Camber: Fabricate horizontal members and inclined members with a slope of less than 1:1, with natural convex bow (crown) up, to provide camber.

B. Shop fabricate members by cutting and restoring exposed surfaces to match specified surfacing. Finish exposed surfaces to remove planing or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.

C. Predrill for fasteners and assembly of units.

D. Coat crosscuts with end sealer.

E. Seal Coat: After fabricating and surfacing each unit, apply a saturation coat of penetrating sealer on surfaces of each unit except for treated wood where the treatment included a water repellent.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Erect heavy timber construction true and plumb. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

1. Install heavy timber construction to comply with Shop Drawings.
2. Install horizontal and sloping members with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports if not continuous.
3. Handle and temporarily support heavy timber construction to prevent surface damage, compression, and other effects that might interfere with indicated finish.

B. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.

C. Fit members by cutting and restoring exposed surfaces to match specified surfacing. Predrill for fasteners and assembly of units.
HEAVY TIMBER CONSTRUCTION

1. Finish exposed surfaces to remove planing or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
2. Coat crosscuts with end sealer.
3. Where preservative-treated members must be cut during erection, apply a field-treatment preservative to comply with AWPA M4.
   a. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
   b. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.

D. Install timber connectors as indicated.

   1. Unless otherwise indicated, install bolts with same orientation within each connection and in similar connections.
   2. Install bolts with orientation as indicated or, if not indicated, as directed by Architect.

3.2 ADJUSTING

A. Repair damaged surfaces and finishes after completing erection. Replace damaged heavy timber construction if repairs are not approved by Architect.

END OF SECTION 061323
SECTION 061500 - STRUCTURAL WOOD DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:


B. Related Sections:

1. Section 061000 "Rough Carpentry" for dimension lumber items associated with wood decking.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For glued-laminated wood decking, include installation instructions and data on lumber, adhesives, and fabrication.

B. Samples: 24 inches long, showing the range of variation to be expected in appearance of wood decking.

1.4 QUALITY ASSURANCE


1.5 DELIVERY, STORAGE AND HANDLING

A. Schedule delivery of wood decking to avoid extended on-site storage and to avoid delaying the Work.

B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings. Stack wood decking with surfaces that are to be exposed in the final Work protected from exposure to sunlight.
PART 2 - PRODUCTS

2.1 WOOD DECKING, GENERAL

A. General: Comply with DOC PS 20 and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Moisture Content: Provide wood decking with fifteen percent (15%) maximum moisture content at time of dressing.

2.2 GLUED-LAMINATED WOOD DECKING

A. Face Species: Douglas fir-larch.

B. Decking Nominal Size: 5x6.

C. Decking Configuration: For glued-laminated wood decking indicated to be of diaphragm design and construction, provide tongue-and-groove configuration that complies with research/evaluation report.

D. Face Grade: Custom or Supreme: Clear face is required. Occasional pieces may contain a small knot or minor characteristic that does not detract from the overall appearance.

E. Face Surface: Smooth.

F. Edge Pattern: Vee grooved.

G. Laminating Adhesive: Wet-use type complying with ASTM D 2559.

1. Use adhesive that contains no urea-formaldehyde resins.

2.3 ACCESSORY MATERIALS

A. Fasteners for Solid-Sawn Decking: Provide fastener size and type complying with decking standard for thickness of deck used.

B. Fasteners for Glued-Laminated Decking: Provide fastener size and type complying with requirements in "Installation" Article for installing laminated decking.

C. Nails: Common; complying with ASTM F 1667, Type I, Style 10.

D. Spikes: Round; complying with ASTM F 1667, Type III, Style 3.

E. Fastener Material: Hot-dip galvanized steel.

F. Bolts for Anchoring Decking to Walls: Carbon steel; complying with ASTM A 307 with ASTM A 563 hex nuts and, where indicated, flat washers, all hot-dip zinc coated.

G. Bolts for Anchoring Decking to Walls: Stainless-steel; complying with ASTM F 593, Alloy Group 1 or 2; with ASTM F 594, Alloy Group 1 or 2 hex nuts and, where indicated, flat washers.
H. Installation Adhesive: For glued-laminated wood decking indicated to be of diaphragm design and construction, provide adhesive that complies with research/evaluation report.

1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

I. Sealant: Latex sealant compatible with substrates.

1. Use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

J. Penetrating Sealer: Clear sanding sealer complying with Section 099300 "Staining and Transparent Finishing" and compatible with topcoats specified for use over it.

2.4 FABRICATION

A. Shop Fabrication: Where preservative-treated decking is indicated, complete cutting, trimming, surfacing, and sanding before treating.

B. Predrill decking for lateral spiking to adjacent units to comply with referenced decking standard.

C. Seal Coat: After fabricating and surfacing decking, apply a saturation coat of penetrating sealer in fabrication shop.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and support framing in areas to receive wood decking for compliance with installation tolerances and other conditions affecting performance of wood decking.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install solid-sawn wood decking to comply with referenced decking standard.

1. Locate end joints for two-span continuous lay-up.

B. Install laminated wood decking to comply with manufacturer's written instructions.

1. Locate end joints for two-span continuous lay-up.
2. Nail each course of glued-laminated wood decking at each support with one (1) nail slant nailed above the tongue and one (1) nail straight nailed through the face.
   a. Use 60d nails for 5x6 decking. Predrill decking to prevent splitting.
3. Slant nail each course of glued-laminated wood decking to the tongue of the adjacent course at 30 inches o.c. and within 12 inches of the end of each unit. Stagger nailing in adjacent courses 15 inches.
a. Use 10d nails for 4x6 and 4x8 decking.

4. Glue adjoining decking courses together by applying a 3/8-inch bead of adhesive on the top of tongues according to research/evaluation report.

C. Anchor wood roof decking, where supported on walls, with bolts as indicated.

D. Apply joint sealant to seal roof decking at exterior walls at the following locations:
   1. Between decking and supports located at exterior walls.
   2. Between decking and exterior walls that butt against underside of decking.
   3. Between tongues and grooves of decking over exterior walls and supports at exterior walls.

3.3 ADJUSTING

A. Repair damaged surfaces and finishes after completing erection. Replace damaged decking if repairs are not approved by Architect.

3.4 PROTECTION

A. Provide temporary waterproof covering as the Work progresses to protect roof decking until roofing is applied.

END OF SECTION 061500
SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Wall and ceiling sheathing.
   2. Combination wall sheathing, water resistive barrier and air barrier.
   3. Combination roof sheathing and roof underlayment.
   4. Self-adhering flexible flashing.
   5. Composite nail base insulated roof sheathing.
   6. Subflooring

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for plywood backing panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
   3. For panels with integral water resistive barrier, include data on air/moisture-infiltration protection based on testing according to referencing standards.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For following products, from ICC-ES:

   1. Preservative-treated plywood.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
1.6 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of combination sheathing system that fail due to manufacturing defects within specified warranty period.

1. Construction Period Warranty: Manufacturer shall warrant the panels and tape for weather exposure for a period of one hundred eighty (180) days from installation.
2. System Warranty Period: Thirty (30) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

B. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.3 WALL SHEATHING

A. Plywood Sheathing: DOC PS 1, C-D Grade, Exposure 1 sheathing.

1. Nominal Thickness: Not less than ½-inch unless otherwise indicated.

2.4 COMBINATION WALL SHEATHING, WATER-RESISTIVE BARRIER, AND AIR BARRIER

A. Oriented-Strand-Board Wall Sheathing: With integral water-resistant barrier, Exposure 1 sheathing.

1. Basis-of-Design:

   a. Huber Engineered Woods LLC; ZIP System Roof and Wall Sheathing
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2. Span Rating, Panel Grade and Performance Category: Not less than 32/16 Structural 1; 1/2 Performance Category.
3. Edge Profile: Square edge.
4. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 16 inches and 24 inches on centers spacings.
6. Factory laminated integral water-resistant barrier facer.
7. Perm Rating of Integral Water-Resistive Barrier: 12-16 perms.
8. Assembly maximum air leakage of 0.0072 cfm/sq. ft. infiltration and 0.0023 cfm/ sq. ft. exfiltration at a pressure differential of 1.57.
9. Exposure Time: Designed to resist weather exposure for one hundred eighty (180) days.

2.5 COMBINATION ROOF SHEATHING AND ROOF UNDERLAYMENT

A. Oriented-Strand-Board Roof Sheathing: With integral water-resistant barrier, Exposure 1, Structural I sheathing.

1. Basis-of-Design:
   a. Huber Engineered Woods LLC; ZIP System Roof and Wall Sheathing
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2. Span Rating, Panel Grade and Performance Category: Not less than 40/20; Structural 1; 5/8 Performance Category.
3. Edge Profile: Tongue and groove.
4. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 16 inches and 24 inches on center spacings.
7. Exposure Time: Designed to resist weather exposure for one hundred eighty (180) days.

2.6 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING

A. Vented, Plywood-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C 1289, with DOC PS 2, Exposure 1 plywood adhered to spacers on one (1) face.

1. Manufacturers:
   a. Atlas Roofing Corporation
   b. Hunter Panels
   c. Johns Manville; a Berkshire Hathaway company
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2. Polyisocyanurate-Foam Thickness: 4 inches.
4. Spacers: Wood furring strips or blocks not less than 1-inch-thick and spaced not more than 12 inches o.c.
2.7 SUBFLOORING AND UNDERLAYMENT

A. Plywood Subflooring: Exposure 1, Structural I single-floor, tongue and groove panels or sheathing.
   1. Nominal Thickness: ¾-inch unless otherwise indicated.

2.8 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. For roof and wall sheathing, provide fasteners of Type 304 stainless-steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C 1002.

2.9 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
   1. Adhesives shall have a VOC content of 70 g/L or less.

B. Self-Adhering Seam and Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, proprietary seam tape consisting of polyolefin film with acrylic adhesive.
   1. Basis-of-Design:
      a. Huber Engineered Woods LLC; ZIP System Seam and Flashing Tape
      b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

   2. Thickness: 0.012-inch.
   3. Width: 3.75-inch at panel edges, 6-inch at door and window openings.
   5. International Code Council (ICC), ICC-ES ESR2227 (ZIP System Tape).
   6. American Architectural Manufacturer’s Association; AAMA 711.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate roof and wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION


B. Fastening Methods: Fasten panels as indicated below:

1. Roof and Wall Sheathing:
   a. Glue and screw to wood framing.
   b. Space panels 1/8-inch apart at edges and ends.
   c. Install fasteners 3/8-inch to ½-inch from panel edges.
   d. Space fasteners in compliance with requirements of authority having jurisdiction.

2. SubfLOORING:
   a. Glue and nail to wood framing.
   b. Space panels 1/8-inch apart at edges and ends.

3.4 JOINT TREATMENT FOR COMBINATION SHEATHING

A. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply proprietary seam tape to joints between sheathing panels.
2. Utilize tape gun or hard rubber roller provided by manufacturer to ensure tape is completely adhered to substrates.
3.5 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. After flashing has been applied, roll surfaces with a hard rubber to ensure that flashing is completely adhered to substrates.

END OF SECTION 061600
SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Wood roof trusses.
   2. Wood girder trusses.
   3. Wood truss bracing.
   4. Metal truss accessories.

B. Related Sections include the following:
   1. Division 06 Section "Rough Carpentry" for roof sheathing.

C. Allowances: Provide wood truss bracing under the Metal-Plate-Connected Truss Bracing Allowance as specified in Division 01 Section "Allowances."

1.3 DEFINITIONS

A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

B. TPI: Truss Plate Institute, Inc.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

   2. NLGA: National Lumber Grades Authority.
   4. WCLIB: West Coast Lumber Inspection Bureau.
   5. WWPA: Western Wood Products Association.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.

   1. Design Loads: As indicated.
   2. Maximum Deflection Under Design Loads:

1.5 SUBMITTALS

A. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer licensed in the State of Connecticut. Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
5. Show splice details and bearing details.
6. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer licensed in the State of Connecticut responsible for their preparation.

B. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.

C. Qualification Data: For metal-plate manufacturer, professional engineer, fabricator and installer.

D. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

1.6 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.

1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.

B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

C. Source Limitations for Connector Plates: Obtain metal connector plates from a single manufacturer.

D. Comply with applicable requirements and recommendations of the following publications:

1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."

3. TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."

E. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations of TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."

1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
3. Provide for air circulation around stacks and under coverings.

B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

1.8 COORDINATION

A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S.
3. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

B. Grade and Species: For truss chord and web members, provide dimension lumber of any species, graded visually or mechanically, and capable of supporting required loads without exceeding allowable design values according to AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

C. Grade and Species: Provide visually graded dimension lumber for truss chord and web members, of not less than the following grade and[ any of] the following species:

1. Grade for Chord Members: No. 1.
2. Grade for Web Members: No. 2.
3. Species: Hem-fir (north); NLGA.
4. Species: Southern pine; SPIB.
5. Species: Douglas fir-larch; WCLIB or WWPA.

D. Minimum Chord Size For Roof Trusses: 2 by 6 inches nominal (38 by 140 mm actual) for both top and bottom chords.

E. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 06 Section Rough Carpentry.

2.2 METAL CONNECTOR PLATES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpine Engineered Products, Inc.
2. Cherokee Metal Products, Inc.; Masengill Machinery Company.
3. CompuTrus, Inc.
4. Eagle Metal Products.
5. Jager Building Systems, Inc.
6. MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.
7. Robbins Engineering, Inc.
8. TEE-LOK Corporation; a subsidiary of Berkshire Hathaway Inc.

C. General: Fabricate connector plates to comply with TPI 1.

D. Hot-Dip Galvanized Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

1. Use for interior locations where stainless steel is not indicated.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.


D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.
2.4 METAL TRUSS ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:

1. Cleveland Steel Specialty Co.
2. Harlen Metal Products, Inc.
3. KC Metals Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. Southeastern Metals Manufacturing Co., Inc.
6. USP Structural Connectors.

D. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.


1. Use for interior locations where stainless steel is not indicated.

F. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick. Tie fastens to one side of truss, top plates, and side of stud below.

G. Roof Truss Clips: Angle clips for bracing bottom chord of roof trusses at non-load-bearing walls, 1-1/4 inches wide by 0.050 inch thick. Clip is fastened to truss through slotted holes to allow for truss deflection.

2.5 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.

2.6 FABRICATION

A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.

C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to TPI recommendations and as indicated.

E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.

F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.

G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in truss accessories according to manufacturer's fastening schedules and written instructions.

H. Securely connect each truss ply required for forming built-up girder trusses.

1. Anchor trusses to girder trusses as indicated.

I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

1. Install bracing to comply with Division 06 Section Rough Carpentry.

2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

J. Install wood trusses within installation tolerances in TPI 1.

K. Do not cut or remove truss members.

L. Replace wood trusses that are damaged or do not meet requirements.

1. Do not alter trusses in field.

3.2 REPAIRS AND PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

C. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

D. Protective Coating: Clean and prepare exposed surfaces of metal connector plates. Brush apply primer, when part of coating system, and one coat of protective coating.

1. Apply materials to provide minimum dry film thickness recommended by coating system manufacturer.

END OF SECTION 061753
SECTION 062013 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Exterior wood trim, brackets, planks.
   2. Exterior cellular PVC trim, fascia, soffit, skirt and beadboard ceilings and foam plastic moldings, etc. (composite).
   3. Exterior fiberglass columns.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for framing exposed to view.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
   1. Include data on fiberglass component products, including manufacturer’s specification product sheet.

B. Submit shop drawings for fiberglass products indicating dimensions, adjacent construction, materials, thicknesses, fabrication details, required clearances, field jointing, tolerances, colors, finishes, methods of support, integration of electrical components and anchorages.

C. Samples: For each type of product involving selection of colors, profiles, or textures.

1.4 INFORMATIONAL SUBMITTALS

A. Compliance Certificates:
   1. For lumber that is not marked with grade stamp.
   2. For preservative-treated wood that is not marked with treatment-quality mark.

B. Evaluation Reports: For the following, from ICC-ES:
   1. Cellular PVC trim.
   2. Foam plastic moldings.
C. Sample Warranties: For manufacturer's warranties.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.
   
   1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
   2. Provide for air circulation around stacks and under coverings.

B. Deliver fiberglass materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one (1) coat of specified finish can be applied without exposure to rain, snow, or dampness.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
   
   1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.7 WARRANTY

A. Manufacturer's Warranty for Cellular PVC Trim: Manufacturer agrees to repair or replace trim that fails due to defects in manufacturing within specified warranty period. Failures include, but are not limited to, deterioration, delamination, and excessive swelling from moisture.
   
   1. Warranty Period: Twenty-five (25) years from date of Substantial Completion.

B. Manufacturer’s Warranty for Fiberglass Columns: Manufacturer agrees to repair or replace column that fail in materials or workmanship within specified warranty period.
   
   1. Warranty Period for Fiberglass Columns: One (1) year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.
   
   1. Factory mark each piece of lumber with grade stamp of inspection agency, indicating grade, species, moisture content at time of surfacing, and mill.
2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

B. Advanced fiberglass reinforced polymers (FRP).

2.2 EXTERIOR TRIM

A. Lumber Trim for Unfinished Applications:
   1. Species and Grade: Western red cedar; NLGA, WCLIB, or WWPA Grade A and Better.
   2. Maximum Moisture Content: Fifteen percent (15%) with at least eighty-five percent (85%) of shipment at twelve percent (12%) or less.
   4. Face Surface: Surfaced (smooth).

B. Cellular PVC Trim: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for exterior use, made from UV- and heat-stabilized, rigid material.
   1. Basis-of-Design:
      a. Vycom Corp.; Azek
   2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Fypon Ltd.; Fypon PVC
      b. Kleer Lumber, LLC; Kleer Trimboard
      c. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   3. Density: Not less than 31 lb/cu. ft.
   4. Heat Deflection Temperature: Not less than 130 deg F (54 deg C), according to ASTM D 648.
   5. Coefficient of Thermal Expansion: Not more than 4.5 x 10^-5 inches/inch x deg F (8.1 x 10^-5 mm/mm x deg C).
   6. Water Absorption: Not more than one percent (1%), according to ASTM D 570.
   7. Flame-Spread Index: 75 or less, according to ASTM E 84.

C. Foam Plastic Moldings: Molded product of shapes indicated, recommended by manufacturer for exterior use, with a tough outer skin on exposed surfaces; factory primed. Exposed surfaces shall not be shaped after molding.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Fypon Ltd.
      b. Focal Point Architectural Products
      c. Melton Classica Incorporated
      d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   2. Density: Not less than 20 lb/cu. ft.
3. Flame-Spread Index: Not more than 75 when tested according to ASTM E 84.
4. Size and profile as indicate on Drawings.

2.3 FIBERGLASS COLUMNS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Hartmann-Sanders
2. HB&G Building Products, Inc.
3. Melton Classics, Inc.
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Size and profile as indicated on Drawings.

C. Shop Finish: White.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1½ inches into substrate. Staples, small brads and wire nails are not acceptable.

1. For applications not otherwise indicated, provide stainless steel fasteners.

B. Wood Glue: Waterproof resorcinol glue recommended by manufacturer for exterior carpentry use.

C. Adhesive for Cellular PVC Trim: Product recommended by trim manufacturer.

D. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.


F. Continuous Soffit Vents: Aluminum hat channel shape with perforations, 2 inches wide and in lengths not less than 96 inches.

1. Finish: As selected by Architect and Owner from manufacturer’s full range to match adjacent finishes.

G. Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and with applicable requirements in Section 079200 "Joint Sealants," recommended by sealant manufacturer and manufacturer of substrates for intended application.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. BASF Building Systems; Sonolac
   b. Bostik, Inc.; Chem-Calk 600
   c. Pecora Corporation; AC-20+
   d. Tremco Incorporated; Tremflex 834
e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.5 FINISH

A. Composite products do not require paint for protection, but shall be painted to achieve a custom color.

B. Finish in accordance with Section 099113 “Exterior Painting” and manufacturer's recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut exterior finish carpentry to fit adjoining work.
3. Refinish and seal cuts as recommended by manufacturer.
4. Install to tolerance of 1/8-inch in 96 inches for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
5. Coordinate exterior finish carpentry with materials and systems in or adjacent to it.
6. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install cellular PVC trim to comply with manufacturer's written instructions.

B. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long except where necessary.
1. Stagger end joints in adjacent and related members.

C. Fit exterior joints to exclude water.

1. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint.

D. Where face fastening is unavoidable, countersink fasteners, fill surface flush (prefabricated plugs), and sand unless otherwise indicated.

3.5 ADJUSTING

A. Replace exterior finish carpentry that is damaged or does not comply with requirements.

1. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

B. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean exterior finish carpentry on exposed and semi-exposed surfaces.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

3.7 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062013
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior millwork, panels, trim, sill, molding, base, corner guards, etc.
2. Interior siding (paneling).

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Section 099123 "Interior Painting" for priming and backpriming of interior finish carpentry.
3. Section 099300 “Staining and Transparent Finishing” for staining and finishing of interior finish carpentry.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer’s written instructions for finishing treated material.
2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
4. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

B. Shop Drawings: For interior architectural woodwork.
1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including blocking and reinforcement concealed by construction and specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in architectural woodwork.

C. Samples: For each type of product involving selection of colors, profiles, or textures and the following:

1. For each species and cut of lumber with non-factory-applied finish, with ½ of exposed surface finished, 50 sq. in.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.
B. Evaluation Reports: For fire-retardant-treated wood, from ICC-ES.
C. Sample Warranty: For manufacturer's warranty.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
PART 2 - PRODUCTS

2.1 INTERIOR ARCHITECTURAL WOODWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

2.2 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's Board of Review. Grade lumber by an agency certified by the American Lumber Standard Committee's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

B. Softwood Plywood: DOC PS 1.

C. Hardboard: AHA A135.4.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC1.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of nineteen percent (19%).
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. Do not use material that is warped or does not comply with requirements for untreated material.
4. Mark lumber with treatment-quality mark of an inspection agency approved by the American Lumber Standard Committee's Board of Review.
5. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

2.4 FIRE-RETARDANT-TREATED MATERIALS

A. General: For applications indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction, and comply with testing requirements; testing by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
1. Kiln dry lumber and plywood after treatment to a maximum moisture content of nineteen percent (19%).

C. Do not use material that does not comply with requirements for untreated material or is warped or discolored.

D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

E. Application: Where indicated.

2.5 INTERIOR WOODWORK

A. Softwood Lumber Trim for Transparent Finish (Stain or Clear Finish):

   1. Species and Grade: Douglas fir-larch or Douglas fir south; NLGA, WCLIB, or WWPA Superior or C & Btr finish, to match adjacent framing.
   2. Maximum Moisture Content: Fifteen percent (15%) with at least eighty-five percent (85%) of shipment at twelve percent (12%) or less.
   4. Face Surface: Surfaced (smooth).

B. Hardwood Lumber for Transparent Finish (Stain or Clear Finish):

   1. Species and Grade: White maple; NHLA A Finish.
   2. Maximum Moisture Content: Ten percent (10%).
   6. Face Surface: Surfaced (smooth).
   7. Matching: Selected for compatible grain and color.

C. Lumber for Opaque Finish (Painted Finish):

   1. Species and Grade: Alder, aspen, basswood, cottonwood, gum, magnolia, soft maple, sycamore, tupelo, or yellow poplar; B Finish; NHLA.
   2. Maximum Moisture Content: Ten percent (10%).
   4. Face Surface: Surfaced (smooth).

2.6 INTERIOR SIDING (PANELING)

A. Shiplap Siding (Wainscot):

   1. Provide kiln-dried lumber siding complying with DOC PS 20.
   2. Species and Grade: Yellow poplar; B Finish; NHLA.
   3. Type: Grade A and Better, square edge, nickel gap, nominal 1-inch thickness.
   4. Width and Finish: WP-1, as indicated in Section 090000 “Schedule of Finishes”:
2.7 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Adhesives: Do not use adhesives that contain urea formaldehyde.

   1. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

      a. Adhesive shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.8 FABRICATION

A. Back out or kerf backs of the following members except those with ends exposed in finished work:

   1. Interior standing and running trim, except crown molds.

B. Ease edges of lumber less than 1-inch in nominal thickness to 1/16-inch radius and edges of lumber 1-inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

C. Prime to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099123 "Interior Painting."

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, too small to fabricate with proper jointing arrangements, or with defective surfaces, sizes, or patterns.
B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
3. Install to tolerance of 1/8-inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

1. Install trim after gypsum-board joint finishing operations are completed.
2. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 SIDING (PANELING) INSTALLATION

A. Install siding to comply with manufacturer’s written instructions and in accordance with applicable rules of grading agencies indicated.

B. Shiplap Siding (Wainscot):

1. Measure each wall area and establish layout to balance border widths at opposite edges of each wall. Avoid using less-than-half-width planks at borders and comply with layout shown on reflected ceiling plans.
2. Install first row and subsequent rows lapped 1-inch over previous row. Nail at each stud. Do not allow nails to penetrate more than one (1) thickness of siding.
   a. Leave 1/8-inch gap at trim and corners unless otherwise recommended by manufacturer and apply sealant.
   b. Butt joints only over framing or blocking, nailing top and bottom on each side and staggering joints in subsequent courses.

3.6 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.
3.7 CLEANING

A. Clean interior finish carpentry on exposed and semi-exposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes, if any.

3.8 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023
SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets and panels.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.
3. Cabinetry and casework hardware and accessories.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show details full size.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.
C. Samples:

1. Plastic laminates, 12 by 12 inches, for each type, color, pattern, and surface finish required.
   a. Provide one (1) sample applied to core material with specified edge material applied to one (1) edge.

2. Corner pieces as follows:
   a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
   b. Miter joints for standing trim.

3. Exposed cabinet hardware and accessories, one (1) unit for each type and finish.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For the following:
   1. Composite wood products.
   2. High-pressure decorative laminate.
   3. Glass.
   4. Adhesives.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of products.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockups of typical architectural cabinets as shown on Drawings.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

   1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of cabinets indicated for construction, finishes, installation, and other requirements.

B. Grade: Custom.

C. Type of Construction: Frameless.

D. Door and Drawer Front Interface Style: Reveal overlay.

   1. Reveal Dimension: ½-inch.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

      a. Abet Laminati, Inc.
      b. Arborite
      c. Formica Corporation
      d. Lab Designs
      e. Lamin-Art, Inc.
      f. Wilsonart International; Div. of Premark International, Inc.

   2. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
F. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Vertical Surfaces: Grade HGS.
3. Edges: PVC edge banding, 0.12-inch-thick, matching laminate in color, pattern, and finish.

G. Materials for Semi-Exposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
   a. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12-inch-thick, matching laminate in color, pattern, and finish.
   b. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood.

H. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

   1. Join subfronts, backs, and sides with glued dovetail joints.

J. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

   1. PL-, as indicated in Section 090000 “Schedule of Finishes”.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

   1. Wood Moisture Content: Five to ten percent (5-10%).

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

   1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
2.3 CABINET HARDWARE AND ACCESSORIES

A. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 170 degrees of opening, self-closing.

B. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16-inch in diameter.

C. Catches:
   1. Cabinets: Roller catches, BHMA A156.9, B03071.
   2. Display Case: Push-in magnetic catches, ANSI/BHMA A156.9, B03131.

D. Adjustable Shelf Standards and Supports: BHMA A156.9, B04102; with shelf brackets, B04112.

E. Shelf Rests (Pins): BHMA A156.9, B04013; metal.

F. Drawer Slides: BHMA A156.9.
   1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
   2. For drawers more than 3 inches high but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100.
   3. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.

G. Door Locks: BHMA A156.11, E07121.
   1. Sized for cabinet thickness on the active leaf as indicated in the documents, with two (2) keys master keyed all alike, with manufacturer's standard finger operated sash lock on the adjacent inactive leaf (in double door applications). For bidding purposes, the Contractor shall assume that one hundred percent (100%) of all cabinet operating door leaves or pairs of doors shall be locked.

H. Drawer Locks: BHMA A156.11, E07041.
   1. Sized for drawer thickness, with two (2) keys master keyed all alike. For bidding purposes, the Contractor shall assume that one hundred percent (100%) of all drawers shall be locked.

I. Door and Drawer Silencers: BHMA A156.16, L03011.

J. Glass for Display Case: ASTM C 1172 clear laminated glass with two (2) plies of fully tempered float glass, exposed edges seamed before tempering; with 0.030-inch polyvinyl butyral interlayer.

K. Hooks: Provide Double Prong Robe Hook Model #4030 manufactured by Stanley Hardware, or approved equal, where indicated in the construction documents.

L. Grommets for Cable Passage: 2½-inch OD, flush mount, plated steel cap with two (2) slots for wire passage.
1. Product: Subject to compliance with requirements, provide "PS-2C" by Doug Mockett & Company, Inc. or approved equal.

M. Foot Rail: Provide 8’ Bar Foot Rail Kit #BARRAIL-KIT-ORB-8FT manufactured by KegWorks, or approved equal, where indicated in the construction documents.

N. Shelving Support Post: 2-inch-diameter, steel tubes and associated nuts, bolts, washers, etc., complying with BHMA A156.16.

O. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.


P. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than fifteen percent (15%) moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesives: Do not use adhesives that contain urea formaldehyde.

1. Adhesive for Bonding Plastic Laminate: Contact cement, water based.


2.5 FABRICATION

A. Fabricate cabinets to dimensions, profiles, and details indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
D. Install glass to comply with applicable requirements in Section 088000 "Glazing" and in GANA's "Glazing Manual."

1. For glass in frames, secure glass with removable stops.
2. For exposed glass edges, polish and grind smooth.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

A. Grade: Install cabinets to comply with quality standard grade of items to be installed.

B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

1. Use filler matching finish of items being installed.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8-inch in 96 inches using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1½-inch penetration into wood framing, blocking, or hanging strips or No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semi-exposed surfaces.

END OF SECTION 064116
SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Extruded polystyrene foam-plastic board.
      2. Glass-fiber blanket.
      4. Spray polyurethane foam insulation.
   B. Related Requirements:
      1. Section 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing" for insulation specified as part of roofing construction.
      2. Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS
   A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
   B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
   B. Protect foam-plastic board insulation as follows:
      1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
      2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
      3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.
PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. DiversiFoam Products
2. Dow Chemical Company (The)
3. Owens Corning
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Extruded Polystyrene Board: ASTM C 578, of type and minimum compressive strength indicated below; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Type VI, 40 psi, underslab and foundation walls.

2.2 GLASS-FIBER BLANKET

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. CertainTeed Corporation
2. Johns Manville
3. Owens Corning
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Glass-Fiber Blanket, Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

1. Thermal Resistance: As indicated in the Drawings.

2.3 SPRAY POLYURETHANE FOAM INSULATION

A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. BioBased Insulation; 1701s
   b. BASF Corporation
   c. Dow Chemical Company (The)
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2. Minimum density of 1.7 lb/cu. ft.
3. Minimum R-Value of 18 at 3 inches.
2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:
   1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

C. Baffle Vent: Preformed, rigid polystyrene sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and roof deck.
   1. Basis-of-Design:
      a. Owens Corning; AtticMate
      b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF SLAB INSULATION

A. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
   1. If not otherwise indicated, extend insulation a minimum of 24 inches in from exterior walls.
3.4 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.5 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one (1) length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
   a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

C. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.6 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100
SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Asphalt shingles.
   2. Underlayment.
   3. Roof vents.
   4. Metal flashing and trim.

B. Related Sections:
   1. Section 061000 "Rough Carpentry" for wood blocking.
   2. Section 061600 "Sheathing" for roof sheathing.
   3. Section 076200 "Sheet Metal Flashing and Trim" for metal flashings.

1.3 DEFINITION

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA’s "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each exposed product and for each color and texture specified.
   1. Asphalt Shingles: Full size.
   2. Ridge and Hip Cap Shingles: Full size.
   3. Roof Vent: 12-inch-long Sample.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.
C. Evaluation Reports: For each type of asphalt shingle and synthetic underlayment required, from the ICC.

D. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 100 sq. ft of each type, in unbroken bundles.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.

B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.

C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.11 PROJECT CONDITIONS

A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.12 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Manufacturing defects.

b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.

2. Material Warranty Period: Forty (40) years from date of Substantial Completion.

3. Workmanship Warranty Period: Twenty (20) years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES


1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   
a. CertainTeed Corporation; Landmark Premium
b. GAF Materials Corporation; Timberline Ultra HD
c. Owens Corning; Duration Premium
d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2. Color and Blends: As selected by Architect and Owner from manufacturer's full range.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS


1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   
a. Grace, W. R. & Co. - Conn
b. Johns Manville
c. Owens Corning
d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.4 ROOF VENTS

A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   
a. Air Vent, Inc.; a Gibraltar Industries company
b.  Cor-A-Vent, Inc.
c.  GAF Materials Corporation
d.  Owens Corning
e.  Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B.  Attic Roof Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic attic roof vent; for use on the roof top under shingles.

1.  Basis-of-Design Product:

a.  Cor-A-Vent, Inc.; IN-Vent

2.  Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a.  Air Vent, Inc.; a Gibraltar Industries company
b.  DCI Products
c.  GAF Materials Corporation
d.  Owens Corning
e.  Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

3.  Minimum Net Free Area: 10 square inches per lineal foot.
4.  Width: 4 feet.
5.  Thickness: 1-inch.

2.5  ACCESSORIES

A.  Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B.  Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch-diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch-diameter flat head and of sufficient length to penetrate ¾-inch into solid wood decking or extend at least 1/8-inch through plywood sheathing.

1.  Where nails are in contact with metal flashing, use nails made from same metal as flashing.

2.6  METAL FLASHING AND TRIM

A.  General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1  EXAMINATION

A.  Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1.  Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3½ inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven (7) days.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

3.4 ASPHALT SHINGLE INSTALLATION

A. General: Install asphalt shingles according to manufacturer's written instructions and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.

1. Extend asphalt shingles ½-inch over fasciae at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt shingle strips with a minimum of four (4) roofing nails located according to manufacturer's written instructions.

1. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.

E. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.

1. Set valley edge of asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
2. Do not nail asphalt shingles to metal open-valley flashings.
F. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

G. Attic Roof Vents: Install attic roof vents according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113
SECTION 073116 - METAL SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal shingles.
2. Underlayment materials.
3. Sheet metal flashing and trim.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D1079 for definitions of terms related to roofing Work in this Section.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each of the following:

1. Metal shingles.
2. Underlayment materials.
5. Sealant.

B. Shop Drawings: For metal shingles. Include roof plans; sections at hips, gables, ridges, valleys, and eaves; details of metal shingles and joint patterns, flashing, trim, accessories, and attachments to other Work.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For metal shingles, for tests performed by a qualified testing agency.

B. Evaluation Reports: From an agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes for the following:
1. Synthetic underlayment.

C. Sample Warranty: For manufacturer's materials warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal shingles to include in maintenance manuals.

B. Materials warranties.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Metal Shingles: 100 sq. ft. of exposed area, in each type and color, in unbroken bundles.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store metal shingle materials in a dry, well-ventilated location protected from weather and moisture in accordance with manufacturer's written instructions. Do not allow metal shingles to contact with other materials that might cause staining, denting, or other surface damage. Store metal shingle materials away from uncured and wet concrete and masonry.

1. Retain strippable protective covering on metal shingles during installation.

B. Store underlayment rolls in a dry, well-ventilated location protected from weather, sunlight, and moisture in accordance with manufacturer's written instructions.

1. Store on end, on pallets or other raised surfaces.
2. Do not double-stack rolls.

C. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing Work is not in progress.

D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit product installation and related Work to be performed in accordance with manufacturer's written instructions and warranty requirements.

1. Install self-adhering, polymer-modified bitumen sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.11 WARRANTY

A. Materials Warranty: Manufacturer agrees to repair or replace metal shingles and accessories that fail within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Structural failures including wind uplift.
   b. Water penetration.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Metal Shingle Warranty Period: Fifty (50) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS
   A. Obtain each type of product from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS
   A. Exterior Fire-Test Exposure: Provide metal shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance in accordance with ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.3 METAL SHINGLES
   A. Copper, Individual Shingles: Factory-formed, interlocking rectangular units.
      1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         a. American Metal Roofs
         b. East Coast Metal Roofing
         c. Revere Copper Products, Inc.
         d. Zappone Manufacturing, LLC
         e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
      2. Material: Copper sheet, minimum 12 oz./sq. ft.
      3. Exposure: 9½ by 17½ inches.
      4. Finish: Mill.
   
   B. Finish Protection: Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.4 SHEET METAL MATERIALS
   A. Copper Sheet: ASTM B370; Temper H00, cold rolled unless Temper 060 is required for forming.
      1. Mill Finish: Non-patinated and exposed.
2.5 UNDERLAYMENT MATERIALS

A. Self-Adhering, Synthetic Underlayment: UV-resistant polypropylene, polyolefin, or polyethylene polymer fabric with surface coatings or treatments to improve traction underfoot and abrasion resistance; recommended in writing by manufacturer for use under metal shingles; and evaluated and documented to be suitable for use as a roof underlayment under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Certainteed Saint-Gobain
   b. Owens Corning
   c. Tamko Building Products, Inc.
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.6 SHEET METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Metal shingle manufacturer's flashing and trim components matching shingle material, color, and finish unless otherwise specified in this Section, indicated on Drawings, or recommended in writing by metal shingle manufacturer. Fabricate to sizes and configurations required for a weathertight installation. Unless otherwise specified in this Section or indicated on Drawings, fabricate sheet metal flashing and trim to comply with recommendations that apply to design, dimensions, metal, and other characteristics of the item in SMACNA's "Architectural Sheet Metal Manual."

1. Valley Flashing: Fabricate to extend not less than 8 inches from the centerline of the valley with a splash-diverter rib not less than \( \frac{3}{4} \)-inch high at the flowline formed as part of the flashing.

2.7 ACCESSORIES

A. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187.

B. Asphalt Roofing Cement: ASTM D4586 Type II, asbestos free.

C. Sealant: ASTM C920, Type S, Grade NS, one-part, non-sag elastomeric polymer joint sealant as recommended in writing by metal shingle manufacturer for installation indicated; of class and use classifications required to seal joints and remain watertight. Where sealant is exposed, provide in color matching shingle.

D. Sheet Metal Fasteners: Noncorrosive screws, nails, and anchors designed to withstand design loads and recommended in writing by metal shingle manufacturer.

1. Exposed Fasteners: Heads matching color of metal shingles using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC washers under heads of exposed fasteners bearing on weather side of shingles.

2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
4. Fasteners for Copper Sheet: Copper, hardware bronze, or Series 300 stainless-steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking, that tops of fasteners are flush with surface, and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry to the maximum moisture content recommended in writing by metal shingle manufacturer, smooth, clean, sloped for drainage, and completely anchored and that provisions have been made for flashings and penetrations through metal shingles.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT MATERIALS

A. Comply with metal shingle and underlayment manufacturers' written installation instructions and with recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in this Section or indicated on Drawings.

B. Synthetic Underlayment:
   1. Install on roof deck parallel with and starting at the eaves.
      a. Lap sides and ends and treat laps as recommended in writing by manufacturer, but not less than 2 inches for side laps and 6 inches for end laps.
      b. Stagger end laps between succeeding courses at interval recommended in writing by manufacturer, but not less than 72 inches.
      c. Cover underlayment within period recommended in writing by manufacturer.
   2. Install in double layer on roofs sloped at less than 4:12.
   3. Terminate synthetic underlayment extended up not less than 4 inches against sidewalls, curbs, chimneys, and other roof projections.

C. Valley Underlayment: Install one (1) layer of 36-inch-wide underlayment centered in valley, running full length of valley, and on top of underlayment on field of roof that is woven through valley. Install all layers of underlayment in and through valley tight with no bridging.
   1. Use same underlayment as installed on field of roof.
2. Lap ends at least 12 inches in direction that sheds water, and seal with asphalt roofing cement.
3. Solidly cement valley underlayment to roof-field underlayment that is woven through valley using asphalt roofing cement.

3.3 INSTALLATION OF SHEET METAL FLASHINGS AND TRIM
A. Install metal flashings and trim in accordance with manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" unless more stringent requirements are specified in this Section or indicated on Drawings.

1. Install with minimum 4-inch end laps.

3.4 INSTALLATION OF ACCESSORIES
A. Install accessories in accordance with manufacturers' written instructions unless more stringent requirements are specified in this Section or indicated on Drawings.
B. Metal Protection: Where dissimilar metals contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering, polymer-modified bitumen sheet to each contact surface, or by other means of permanent separation recommended in writing by manufacturer of metal shingles or of the metals in contact.

3.5 INSTALLATION OF METAL SHINGLES
A. Install metal shingles in accordance with manufacturer's written instructions true in line.
B. Maintain uniform exposure and coursing of metal shingles throughout roof.
C. Apply sealant between shingles, flashing, trim, and exposed fasteners to achieve a weathertight system.
D. Interlock and overlap shingles, and stagger end joints from shingle courses above and below.
E. Metal Protection: Where dissimilar metals contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering, polymer-modified bitumen sheet to each contact surface, or by other means of permanent separation recommended in writing by manufacturer of metal shingles or of the metals in contact.

1. Do not use graphite pencils to mark metal surfaces.

3.6 ADJUSTING
A. Remove and replace damaged or deformed metal shingles. Replace shingles with damaged or deteriorated finishes and other components of the Work that cannot be successfully repaired by finish touchup or similar minor repair procedures.
B. Remove temporary protective coverings and strippable films as metal shingles are installed unless otherwise indicated in manufacturer's written installation instructions.
C. On completion of installation, touch up minor nicks and abrasions in finish, in accordance with manufacturer's written instructions.
D. Remove excess sealants.

END OF SECTION 073116
SECTION 074646 - FIBER CEMENT SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes fiber cement siding.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, grounds, nailers, and blocking.

1.3 COORDINATION

A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: For fiber-cement siding including related accessories.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.

B. Research/Evaluation Reports: For each type of fiber-cement siding required, from ICC-ES.

C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.
1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish full lengths of fiber-cement siding including related accessories, in a quantity equal to two percent (2%) of amount installed.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with labels intact until time of use.
B. Store materials on elevated platforms, under cover, and in a dry location.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including cracking and deforming.
   b. Deterioration of materials beyond normal weathering.

2. Warranty Period: Thirty (30) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.

2.2 FIBER-CEMENT SIDING

A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.

1. Basis of Design:
   a. James Hardie Building Products; **HardiePlank Select Cedarmill** and **HardiePanel Vertical Siding Select Cedarmill**

2. Manufacturers:
   a. Allura USA
   b. Certainteed Corporation
   c. Maxitile
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

H. Smith Richardson Golf Course Clubhouse – Fairfield
074646-2
B. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

C. Nominal Thickness: Not less than ¼-inch.

D. Horizontal Pattern: Boards 6¼ to 6½ inches (5-inch exposure) in plain style.
   1. Texture: Wood grain.

E. Vertical Pattern: 48-inch-wide sheets with wood-grain texture and grooves.

F. Colors: Factory-finished in one (1) color, as selected by Architect and Owner from manufacturer’s entire range.

2.3 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
   1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.

B. Batten: Boards 2 ½ inches wide with wood-grain texture, ¾-inch-thick, nominal.
   1. Basis of Design: James Hardie Building Products; **HardieTrim Boards Rustic Grain Batten Boards**

C. Flashing: Provide aluminum flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

D. Fasteners:
   1. For fastening to wood, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1-inch into substrate.
   2. For fastening fiber cement, use stainless-steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of fiber-cement siding and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.
3.3 INSTALLATION

A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

1. Do not install damaged components.
2. Install fasteners no more than 16 inches o.c.
3. Provide minimum 6-inch clearance between panel system and finished grade.

B. Cut panels to fit around penetrations with maximum ¼-inch gaps. Smooth and seal cut edges.

C. Place fasteners exposed, minimum 3/8 inch from panel edges and 2 inches from top and bottom edges at panel corners, in orderly fastening pattern.

D. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.

3.4 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074646
SECTION 075216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing.
2. Roof insulation.
3. Walkways.

B. Related Sections:

1. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
2. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
3. Section 221423 "Storm Drainage Piping Specialties" for roof drains.

1.3 DEFINITIONS


1.4 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane terminations.
3. Flashing details at penetrations.
4. Tapered insulation, including slopes.
5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
6. Crickets, saddles, and tapered edge strips, including slopes.
7. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
C. Samples: For the following products:
   2. Roof insulation.
   3. Walkway pads or rolls, of color required.
   4. Six (6) insulation fasteners of each type, length, and finish.

D. Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer, manufacturer and testing agency.

B. Manufacturer Certificates:
      a. Submit evidence of complying with performance requirements.
   2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

C. Product Test Reports: For roof membrane and insulation, tests performed by a qualified testing agency, indicating compliance with specified requirements.

D. Evaluation Reports: For components of membrane roofing system, from ICC-ES.

E. Field quality-control reports.

F. Sample Warranties: For manufacturer’s special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
   1. Protect stored liquid material from direct sunlight.
   2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
   1. Store in a dry location.
   2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, metal flashings, roof drainage fabrications, and other components of roofing system for an edge-to-edge warranty.
   2. Warranty Period: Twenty (20) years, non-prorated, no-dollar-limit, from date of Substantial Completion.

B. Provide self-adhesive emblems for each roof hatch, door or access way, notifying the user of the roof condition, precautionary measures and other conditions of use or maintenance of the roofing membranes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. CertainTeed Corp.
2. Firestone Building Products
3. GAF Materials Corporation
4. Garland Company, Inc. (The)
5. Johns Manville, a Berkshire Hathaway company
6. Siplast, Inc.
7. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturer approved by roof membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing system and flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

C. Roofing System Design: Tested by a qualified testing agency to resist the uplift requirements as indicated on the Drawings.

D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class C; for application and roof slopes indicated; testing by a qualified testing agency.

1. Identify products with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.

1. Identify products with appropriate markings of applicable testing agency.

2.3 ROOFING SHEET MATERIALS

A. Roofing Membrane Base Sheet: ASTM D 6164, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with polyester fabric); smooth surfaced; suitable for application method specified.

B. Granule-Surface Roofing Membrane Cap Sheet: ASTM D 6164, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with polyester fabric); granular surfaced; suitable for application method specified, and as follows:

1. Granule Color: As selected by Architect and Owner from manufacturer’s full range.
2.4 BASE FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D 6164, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with glass fiber fabric) smooth surfaced; suitable for application method specified.

B. Granule-Surfaced Flashing Sheet: ASTM D 6164, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with glass fiber fabric) granular surfaced; suitable for application method specified, and as follows:
   1. Granule Color: As selected by Architect and Owner from manufacturer’s full range, to match cap sheet.

2.5 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
   1. Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

C. Roof Vents: As recommended by roof membrane manufacturer.

D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8-inch-thick; with anchors.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

F. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, non-skinning, and nondrying.

G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

H. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with one hundred percent (100%) passing No. 8 sieve and ninety-eight percent (98%) of mass retained on No. 40 sieve, color to match roofing membrane.

I. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

J. Penetration Flashing: Two-part, liquid-applied flashing material that cures to a durable, elastomeric film. Flashing system consists of primer, flashing cement and polyester scrim.
   1. Basis of Design:
      a. Johns Manville; PermaFlash System
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Firestone Building Products
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

3. System must be compatible with roofing membrane system and be part of the warranty.

K. EPDM: ASTM D 4637, Type I, 60 mils thick, nominal, non-reinforced, EPDM sheet.

L. Bonding Adhesive: Manufacturer's standard, water-based or low-VOC solvent based.

2.6 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roof membrane manufacturer.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
   1. Compressive Strength: 20 psi.

C. Perlite Board Insulation: ASTM C 728, Type 1, rigid, mineral-aggregate thermal insulation board composed of expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal coated.

D. Tapered Insulation: Provide factory-tapered insulation boards.
   1. Material: Match roof insulation.
   3. Slope:
      a. Roof Field: ¼-inch per foot unless otherwise indicated on Drawings.
      b. Saddles and Crickets: ½-inch per foot unless otherwise indicated on Drawings.

2.7 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Insulation Cant Strips: ASTM C 728, perlite insulation board.

D. Wood Nailer Strips: Comply with requirements in Section 061000 "Rough Carpentry."

E. Tapered Edge Strips: ASTM C 728, perlite insulation board.
F. Cover Board: ASTM C 1289, Type II, Class 4, Grade 2, polyisocyanurate board substrate with glass-fiber mat facer on both major surfaces.

2.8 ASPHALT MATERIALS

A. Roofing Asphalt: ASTM D 312, Type IV.

2.9 WALKWAYS

A. Walkway Pads: Reinforced asphalitic composition pads with slip-resisting mineral-granule surface, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/8-inch-thick, minimum.

   1. Pad Size: Manufacturer's standard.
   2. Color: In contrasting color of roofing membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:

   1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
   2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions.

   1. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

   1. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Perform fastener-pullout tests according to roof system manufacturer's recommendations.

   1. Submit test result within 24 hours of performing tests.

      a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.
3.3 INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast.
   1. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Asphalt Heating:
   1. Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application.
      a. For cap sheets, heat asphalt according to cap sheet manufacturer's recommendations.
   2. Circulate asphalt during heating.
   3. Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application.
      a. For cap sheets, comply with cap sheet manufacturer's recommendations.
   4. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating.
   5. Do not heat asphalt within 25 deg F (14 deg C) of flash point.
   6. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
   7. Apply hot roofing asphalt within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
      a. For cap sheets, comply with cap sheet manufacturer's recommendations.

D. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSULATION INSTALLATION

A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Nailer Strips: Mechanically fasten 4-inch nominal-width wood nailer strips of same thickness as insulation perpendicular to sloped roof deck at the following spacing:
   1. 48 inches apart for roof slopes greater than 3 inches per 12 inches (3:12).
D. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.

E. Install tapered insulation under area of roofing to conform to slopes indicated.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼-inch with insulation.
   1. Cut and fit insulation within ¼-inch of nailers, projections, and penetrations.

G. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or more, install two (2) or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
   1. Where installing composite and non-composite insulation in two (2) or more layers, install non-composite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.

H. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

I. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

J. Mechanically Fastened and Adhered Insulation (Wood Decks): Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
   2. Set each subsequent layer of insulation in a solid mopping of hot roofing asphalt applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.

K. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6 inches in each direction from joints of insulation below. Loosely butt cover boards together. Tape joints if required by roofing system manufacturer.
   1. Apply hot roofing asphalt to underside, and immediately bond cover board to substrate.

3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing".

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Where roof slope exceeds ¾-inch per 12 inches (1:18), install roofing membrane sheets parallel with slope.
1. Backnail roofing sheets to nailer strips according to roofing system manufacturer's written instructions.

D. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day’s work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane base sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing in one (1) of the following ways:

1. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F (218 deg C).
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing sheets so side and end laps shed water.

3.7 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Adhere backer sheet to substrate in a solid mopping of hot roofing asphalt at rate required by roofing system manufacturer. Seal all laps.
3. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at asphalt temperature recommended by flashing sheet manufacturer. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
1. Seal top termination of base flashing.

D. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.

E. Roof Drains: Set 30-by-30-inch 4-pound metal flashing in bed of asphaltic adhesive on completed roofing membrane.
   1. Cover metal flashing with roofing cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of roofing membrane.
   2. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
   3. Install stripping according to roofing system manufacturer's written instructions.

F. Penetration Flashing: Tape off area to be flashed. Prime protrusion with system approved primer. Apply system base coat. While tacky, embed system polyester scrim. Apply system top coat. Remove masking tape.

G. Bonding Adhesive: Apply to substrate and underside of EPDM at rate required by manufacturer, and allow to partially dry before installing membrane. Do not apply to splice area of roof membrane.

3.8 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
   1. Set walkway pads in additional pour coat of hot roofing asphalt after aggregate surfacing of modified bituminous roofing membrane.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

C. Roofing system will be considered defective if it does not pass tests and inspections.
   1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.10 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.
   1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 075216
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Formed roof-drainage sheet metal fabrications.
   2. Formed steep-slope roof sheet metal fabrications.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
   2. Section 077200 "Roof Accessories" for equipment supports, vents, and other manufactured roof accessory units.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak-proof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.
   1. Include plans, elevations, sections, and attachment details.
   2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
   3. Include identification of material, thickness, weight, and finish for each item and location in Project.
   4. Include details for forming, including profiles, shapes, seams, and dimensions.
   5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   6. Include details of termination points and assemblies.
   7. Include details of roof-penetration flashing.
8. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
9. Include details of special conditions.
10. Include details of connections to adjoining work.
11. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches (1:5).

C. Samples: For each type of sheet metal and accessory indicated with factory-applied finishes.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.
B. Product Certificates: For each type of coping and roof edge flashing that is tested and approved.
C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For roof edge flashings that are tested and approved in accordance with Chapter 16 of the International Building Code, shop shall be listed as able to fabricate required details as tested and approved.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.9 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Wind Design Standard: Manufacture and install roof edge flashings tested according to Chapter 16 of the International Building Code and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:

   a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than seventy percent (70%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Color: As selected by Architect and Owner from manufacturer's full range.
2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.

b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless-steel.

D. Sealant Tape: Pressure-sensitive, one hundred percent (100%) solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape ½-inch-wide and 1/8-inch-thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polysulfide polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.


I. Downspout Boots: Of material and profile to align with and connect to storm water pipe riser.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

2. Obtain field measurements for accurate fit before shop fabrication.

3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of ¼-inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1-inch-deep, filled with butyl sealant concealed within joints.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams of stainless-steel with flat-lock seams. Tin edges to be seamed, form seams, and solder.

2. Fabricate nonmoving seams of aluminum with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

H. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter brackets and twisted gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.

1. Gutter Profile: As indicated on Drawings.

2. Expansion Joints: Lap type.

3. Fabricate from the following materials:

   a. Aluminum: 0.050-inch-thick.
B. Downspouts: Fabricate downspouts in profile and dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

1. Fabricate from the following materials:
   a. Aluminum: 0.040-inch-thick.

2.7 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step and Cricket Flashing: Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick.

B. Valley Flashing: Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick.

C. Drip Edges: Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick, hemmed where indicated in Drawings.

D. Eave, Rake, and Ridge Flashing: Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick.

E. Base Flashing: Fabricate from the following materials:

1. Aluminum: 0.040-inch-thick.

F. Counterflashings: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick.

G. Roof-Penetration Flashing: Fabricate from the following materials:

1. Aluminum: 0.032-inch-thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

B. Apply slip sheet, wrinkle free, directly on substrate before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches apart. Attach each cleat with at least two (2) fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1¼ inches for nails and not less than ¾ inch for wood screws.
E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.
   1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for fifty percent (50%) movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
   2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Rivets: Rivet joints in uncoated aluminum and zinc where indicated and where necessary for strength.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with soldered joints. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
   1. Fasten gutter spacers to front and back of gutter.
   2. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
   3. Anchor gutter with gutter brackets spaced not more than 24 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
   4. Install gutter with expansion joints at locations not exceeding 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with 1½-inch telescoping joints.
   1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at existing locations minimum, but at top and bottom and at approximately 60 inches o.c.
   2. Connect downspouts to underground drainage system.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches.

D. Counter Flashing: End counter flashing at termination bars as indicated on Drawings. Seal termination bar with sealant as specified in Section 079200 “Sealants”.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of ¼ inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.8 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Roof curbs.
   2. Preformed flashing sleeves.

B. Related Sections:
   1. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.3 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories.
   1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.
1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:

1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.
3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

B. Sample Warranties: For manufacturer’s special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer’s standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

2.2 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Marley Engineered Products
b. Roof Products and Systems (RPS); a division of Hart & Cooley, Inc.
c. Thybar Corporation
d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Size: As required by mechanical equipment or to match existing.

C. Supported Load Capacity: As required by mechanical equipment or to match existing.

D. Material: Aluminum sheet, minimum 0.090-inch-thick.
   1. Finish: Mill.

E. Construction:
   1. Curb Profile: Profile as indicated on Drawings compatible with roofing system. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
   2. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
   3. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange.
   4. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
   5. Insulation: Factory insulated with 1½-inch-thick glass-fiber board insulation.
   6. Liner: Same material as curb, of manufacturer's standard thickness and finish.
   8. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb, of size and spacing required to meet wind uplift requirements.
   9. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

2.3 PREFORMED FLASHING SLEEVES

A. Exhaust Vent Flashing: Double-walled metal flashing sleeve or boot, insulation filled, with integral deck flange, 12 inches high, with removable metal hood and slotted metal collar.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Custom Solution Roof and Metal Products
      b. Thaler Metal USA Inc
      c. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   2. Metal: Aluminum sheet, 0.063-inch-thick.
   3. Diameter: As required.
B. Vent Stack Flashing: Metal flashing sleeve, uninsulated, with integral deck flange.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Custom Solution Roof and Metal Products
      b. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
      c. Thaler Metal USA Inc.
      d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   2. Metal: Aluminum sheet, 0.063-inch-thick.
   3. Height: 19 inches.
   4. Diameter: As required.
   5. Finish: Manufacturer's standard.

2.4 METAL MATERIALS

A. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
   1. Exposed Coil-Coated Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      a. Two-Coat Fluoropolymer Finish: AAMA 620. System consisting of primer and fluoropolymer color topcoat containing not less than seventy percent (70%) PVDF resin by weight.
   2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.

B. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.

2.5 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Glass-Fiber Board Insulation: ASTM C 726, thickness as indicated.

C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1½ inches thick.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Underlayment:
   1. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated.

F. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide non-removable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

1. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless-steel.

G. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

H. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

I. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.


2.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.

2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.

4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

   1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

   2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.


C. Roof Curb Installation: Install each roof curb so top surface is level.

D. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions.

E. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

A. Clean exposed surfaces according to manufacturer's written instructions.

B. Clean off excess sealants.

C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200
SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Silicone joint sealants.
   2. Latex joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.
B. Samples: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
C. Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.
B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
D. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
C. Product Testing: Test joint sealants using a qualified testing agency.
1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:

1. Architectural sealants shall have a VOC content of 250 g/L or less.

C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
D. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

E. Colors of Exposed Joint Sealants: As selected by Architect and Owner from manufacturer's full range, to match adjacent where required.

2.2 SILICONE JOINT SEALANTS

A. Silicone, Non-Staining: Non-Staining, single-component, non-sag, plus fifty percent (+50%) and minus fifty percent (-50%) movement capability, non-traffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products:
   a. Dow Corning Corporation
   b. Master Bond, Inc.
   c. Pecora Corporation
   d. Tremco Incorporated
   e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Mildew-Resistant, Single-Component, Non-sag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products:
   a. BASF Building Systems; **Omniplus**
   b. Dow Corning Corporation; **786 Mildew Resistant**
   c. Tremco Incorporated; **Tremsil 200 Sanitary**
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. BASF Building Systems; **Sonolac**
   b. Bostik, Inc.; **Chem-Calk 600**
   c. Pecora Corporation; **AC-20+**
   d. Tremco Incorporated; **Tremflex 834**
   e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
B. Cylindrical Sealant Backings: ASTM C 1330, Type B (bi-cellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

   a. Concrete.
   b. Masonry.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-Sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form
smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C1193.
   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
   1. Joint Locations:
      a. Control and expansion joints in unit masonry.
      b. Joints between metal panels.
      c. Joints between different materials listed above.
      d. Perimeter joints between materials listed above and frames of doors, windows and louvers.
      e. Other joints as indicated.
   2. Joint Sealant: Silicone, non-staining, S, NS, 50, NT.

B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
   1. Joint Locations:
      a. Control and expansion joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints of exterior openings where indicated.
      c. Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
d. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
e. Other joints as indicated.


C. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Sealant Location:
   a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   b. Tile control and expansion joints where indicated.
   c. Other joints as indicated.

2. Joint Sealant: Mildew resistant, single component, non-sag, neutral curing, silicone.

END OF SECTION 079200
SECTI0N 081423 - CLAD COMMERCIAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Aluminum-clad hinged wood-framed glass doors.

B. Related Requirements:

1. Section 085200 "Wood Windows" for related wood-framed transom and sidelite windows and mullions.
2. Section 087100 "Door Hardware" for hardware.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of hinged wood-framed glass door.

1. Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions.

B. Shop Drawings: For hinged wood-framed glass doors.

1. Include plans, elevations, sections, and details.
2. Detail attachments to other work, and between units, if any.
3. Include hardware and required clearances.

C. Samples: For each type of hinged wood-framed glass door and for each color and texture specified, 12-inch-long section with weather stripping, glazing bead, and factory-applied color finish.

D. Product Schedule: For hinged wood-framed glass doors. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each hinged wood-framed glass door, for tests performed by a qualified testing agency; and for each class and performance grade indicated, tested at AAMA gateway size.

C. Sample Warranty: For special warranty.
1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For weather stripping, operable panels, and operating hardware to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An installer acceptable to hinged wood-framed glass door manufacturer for installation of units required for this Project.

1.7 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace hinged wood-framed glass doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Failure to meet performance requirements.
   b. Structural failures including excessive deflection.
   c. Excessive water leakage or air infiltration.
   d. Faulty operation of movable panels and hardware.
   e. Deterioration of wood, metals, vinyl, and other materials and finishes beyond normal weathering.
   f. Failure of insulating glass.

2. Warranty Period:
   a. Hinged Door: Ten (10) years from date of Substantial Completion.
   b. Insulating Glass: Twenty (20) years from date of Substantial Completion.
   c. Metal Finish: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain hinged wood-framed glass doors from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Product Certification: AMMA certified with label attached to each door.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: Class CW.
2. Minimum Performance Grade: Grade 30.
C. Thermal Transmittance: NFRC 100 maximum total fenestration product U-factor of 0.32 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum total fenestration product SHGC of 0.30.

2.3 ALUMINUM-CLAD HINGED WOOD-FRAMED GLASS DOORS

A. Basis of Design:

1. Marvin Windows and Doors; Commercial Clad Door

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eagle Window & Door, Inc., a subsidiary of Andersen Corporation
2. Jeld-Wen, Inc.
4. Pella Corporation
5. Weather Shield Manufacturing, Inc.

C. Exterior Surfaces: Extruded aluminum cladding, 0.050-inch-thick, with manufacturer's standard high-performance organic coating.

D. Interior Surfaces: Unfinished.

1. Exposed Unfinished Wood Surfaces: Manufacturer's standard species.

E. Frames and Door Panels: Fabricate from wood components complying with indicated requirements. Provide factory-assembled door panels with wide-profile stiles and factory-assembled frames.

1. Frame Thickness: 1-1/6-inch.
2. Door Thickness: 1¾-inch.

F. Wood Components: Manufacturer's standard LVL or fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than twelve percent (12%) at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32-inch-deep by 2 inches wide; water-repellent preservative treated.

G. Trim and Glazing Stops: Material and finish to match cladding.

H. Integral Nailing Fin: Aluminum nailing fins for securing frame to structure; provide sufficient strength to withstand design pressure indicated.

2.4 GLAZING

A. Glass: GL-13, as indicated in Section 088000 “Glazing”.
2.5 HARDWARE
   A. Hardware: Comply with requirements in Section 087100 “Door Hardware”.

2.6 ACCESSORIES
   A. Dividers (False Muntins): Provide divider grilles in designs indicated for each opening.
      1. Quantity and Type: One (1) per opening, removable from exposed surfaces at exterior and interior lites, unless otherwise noted.
      3. Pattern: As indicated on Drawings.
      4. Profile: As selected by Architect and Owner from manufacturer’s entire range.
      5. Color: To match frame, interior and exterior.
   B. Fasteners: Noncorrosive and compatible with door members, trim, hardware, anchors, and other components.
      1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
   C. Anchors, Clips, and Accessories: Provide anchors, clips, and accessories of aluminum, nonmagnetic stainless-steel, or zinc-coated steel or iron for hinged wood-framed glass doors, complying with ASTM B 456 or ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

2.7 FABRICATION
   A. Fabricate hinged wood-framed glass doors in sizes indicated. Include a complete system for assembling components and anchoring doors.
   B. Fabricate hinged wood-framed glass doors that are reglazable without dismantling panel framing.
   C. Weatherstripping: Provide full-perimeter weather stripping for each door panel unless otherwise indicated.
   D. Factory machine hinged wood-framed glass doors for openings and hardware that is not surface applied.
   E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.
   F. Factory-Glazed Fabrication: Glaze hinged wood-framed glass doors in the factory.

2.8 ALUMINUM FINISHES
   A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than seventy percent (70%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Color and Gloss: As selected by Architect and Owner from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of Work.

B. Verify rough opening dimensions, levelness of threshold substrate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight hinged door installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing hinged doors, hardware, accessories, and other components.

B. Install hinged wood-framed glass doors level, plumb, square, true to line; without distortion, warp, or rack of frames and panels, and without impeding thermal movement; anchored securely in place to structural support; and in proper relation to wall flashing, vapor retarders, air barriers, water/weather barriers, and other adjacent construction. Comply with ASTM E 2112.

C. Set sill members in bed of sealant or with gaskets, as indicated, to provide weathertight construction.

D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials according to ASTM E 2112.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Lubricate hardware and moving parts.

B. Adjust operating panels to provide a tight fit at contact points and weather stripping for smooth operation, without binding, and weathertight closure.

C. Adjust hardware for proper alignment, smooth operation, and proper latching without unnecessary force or excessive clearance.

D. Clean exposed surfaces immediately after installing hinged wood-framed glass doors. Avoid damaging protective coatings and finishes. Remove nonpermanent labels, excess sealants, glazing materials, dirt, and other substances.

E. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
F. Protect hinged wood-framed glass door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances contact hinged wood-framed glass door surfaces, remove contaminants immediately according to manufacturer's written instructions.

G. Replace damaged components.

END OF SECTION 081423
SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Interior stile and rail wood doors.
   2. Fitting stile and rail wood doors to frames and machining for hardware.

B. Related Requirements:
   1. Section 099123 "Interior Painting" for field finishing stile and rail doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include details of construction and glazing.

B. Shop Drawings: For stile and rail wood doors. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:
   1. Dimensions of doors for factory fitting.
   2. Locations and dimensions of mortises and holes for hardware.
   3. Undercuts.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of door, from manufacturer.

B. Sample Warranty: For special warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in opaque plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship, or have warped (bow, cup, or twist) more than ¼ inch in a 42-by-84-inch section, within specified warranty period.

1. Warranty shall be in effect during the following period of time from date of Substantial Completion:

a. Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Marshfield-Algoma, a Masonite Architectural company
2. Eggers Industries
3. Graham Wood Doors; an ASSA ABLOY Group company
4. Simpson Door Company
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations: Obtain stile and rail wood doors from single manufacturer.

2.2 MATERIALS

A. General: Use only materials that comply with referenced standards and other requirements specified.

1. Assemble interior doors, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.

B. Panel Products: Any of the following unless otherwise indicated:

1. Hardboard complying with ANSI A135.4.
2. Veneer-core plywood.

2.3 INTERIOR STILE AND RAIL WOOD DOORS

A. Interior Stile and Rail Wood Doors: Interior stock doors complying with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards," and with other requirements specified.
1. Panel Designs: Indicated on Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

2. Grade: Custom.

3. Finish: Opaque.

4. Door Construction for Opaque Finish:
   a. Stile and Rail Construction: Clear lumber; may be edge glued for width.

5. Stile and Rail Widths: As indicated on Drawings.

6. Molding Profile (Sticking): As selected by Architect and Owner from manufacturer's entire range.

7. Glass: GL-2, complying with Section 088000 "Glazing."

2.4 STILE AND RAIL WOOD DOOR FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:

1. Clearances: Provide 1/8-inch at heads, jambs, and between pairs of doors. Provide 1/2-inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide not more than 3/8-inch from bottom of door to top of threshold.

2. Bevel non-fire-rated doors 1/8-inch in 2 inches at lock and hinge edges.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Glazed Openings: Factory install glazing in doors, complying with Section 088000 "Glazing." Install glass using manufacturer's standard elastomeric glazing sealant complying with ASTM C 920. Secure glass in place with removable wood moldings. Miter wood moldings at corner joints.

2.5 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces, all four (4) edges, edges of cutouts, and mortises with one (1) coat of wood primer specified in Section 099123" Interior Painting."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

   B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

   A. Hardware: For installation, see Section 087100 "Door Hardware."

   B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

   C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

   A. Operation: Rehang or replace doors that do not swing or operate freely.

END OF SECTION 081433
SECTION 081743 - FRP FLUSH DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes fiberglass reinforced polyester (FRP) flush doors and frames.

B. Related Requirements:
   1. Section 087100 “Door Hardware” for door hardware for FRP doors and frames.
   2. Section 088000 “Glazing” for FRP doors and frames.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include material descriptions, components, fabrication, finishes and installation.

B. Shop Drawings: Include the following:
   1. Elevations of each door type, indicating dimensions and tolerances.
   2. Details of doors, including edges and fabrication.
   3. Frame details for each frame type, including dimensioned profiles and thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of each different wall opening condition.
   6. Details of anchorages, joints, field splices, and connections.
   7. Details of moldings, removable stops and glazing.

C. Samples:
   1. Door: Submit manufacturer's sample of door showing face sheets, core, framing and finish.
   2. Color: Submit manufacturer's samples of full range of colors.

D. Schedule: Provide a schedule prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.4 INFORMATIONAL SUBMITTALS

A. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.

B. Warranty: Submit manufacturer's standard warranty.
1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Submit manufacturer's maintenance and cleaning instructions for doors and frames, including maintenance and operating instructions for hardware.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Continuously engaged in manufacturing of doors and frames of similar type to that specified, with a minimum of five (5) years successful experience.
2. Evidence of a compliant documented quality management system.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.

C. Handling: Protect materials and finish from damage during handling and installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors and frames that fail in materials and workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Excessive deflection.
   b. Faulty operation.
   c. Defects in hardware installation.
   d. Deterioration of finish or construction in excess of normal weathering.

B. Warranty Period: Ten (10) years starting on date of shipment. Three (3) years for finish.

1. Limited Lifetime: Covers failure of corner joinery, core deterioration, and delamination or bubbling of door skin and corrosion of all-fiberglass products while the door is in its specified application in its original installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design:

1. Special-Lite Inc.; **AF-100 Smooth Pultruded Fiberglass Door**

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Universal Pultrusions, LLC
2. Substitutions: Under provisions of Section 016310 “Equals and Substitutions”.

2.2 FRP FLUSH DOORS AND FRAMES

A. Doors:

1. Thickness: 1¾ inches.
2. Construction: FRP, pultruded as one (1) monolithic panel, with integral stiles.
3. Reinforcement: Solid FRP shapes to be chemically welded at factory. All structural members shall utilize a chemically resistant UV stabilized resin system.
4. Stile Edge: Seamless 9/16-inch-thick solid FRP.
5. Top Rail: 6-inch pultruded tube profile designed to fit flush and be chemically welded inside the door.
6. Bottom Rail: Pultruded FRP inverted U channel designed to fit flush and be chemically welded inside the door, allowing doors to be field trimmed.
7. Core:
   b. Density: ASTM D 1622, minimum density of 6 pounds per cubic foot.

8. Face Sheet:
   a. Material: Pultruded FRP, 0.125-inch thickness.
   b. Texture: Smooth.
   c. Fiberglass Content: Minimum forty-seven percent (47%) by weight.

9. Cutouts:
   a. Manufacture doors with cutouts for required vision lites.
   b. Factory install vision lites.

B. Frames:

1. Thickness: ¼-inch.
2. Construction: FRP, pultruded as one (1) monolithic panel.
3. Reinforcement: Solid FRP shapes to be chemically welded at factory. All structural members shall utilize a chemically resistant UV stabilized resin system.
4. Anchors:
   a. Type: Anchors of minimum size and type required by applicable door and frame standard.
   b. Quantity: Minimum of three (3) anchors per jamb, with one (1) additional anchor for frames with no floor anchor. Provide one (1) additional anchor for each 24 inches of frame height above 7 feet.
   c. Postinstalled Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
2.3 HARDWARE

A. Premachine doors and frames in accordance with templates from specified hardware manufacturers and hardware schedule.

B. Surface mounted closures will be reinforced for but not prepped or installed at factory.

C. Hardware Schedule: As indicated in Section 087100 “Door Hardware”.

2.4 GLAZING

A. Glazing: Comply with requirements of Section 088000 “Glazing”.

B. Lite Size: As indicated on the Drawings.

2.5 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

2.6 FABRICATION

A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on the Drawings.

B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.

C. Assembly:

1. Door and frame components must be from the same manufacturer.
2. Complete cutting, fitting, forming, drilling, and chemically welding of FRP before assembly.

D. Fit:

1. Maintain continuity of line and accurate relation of planes and angles.
2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

2.7 FINISH

A. Finish: Primer with a finished color coat.

1. Finish: Two-part aliphatic polyurethane, low VOC, Industrial Coating.
2. Thickness: 5 mils.
4. Impact Resistance per ASTM D 2794: 140 in lbs (direct), 50 in lbs (reverse) at 5 mils thick.
5. Color: As selected by Architect and Owner from manufacturer’s full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Notify Architect of conditions that would adversely affect installation or subsequent use.

C. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.

B. Install doors and frames plumb, level, square, true to line, and without warp or rack.

C. Install glazing as specified in Section 088000 "Glazing."

D. Frames:

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set.
   a. Install frames with removable stops located on secure side of opening.

E. Doors:

1. Install exterior doors to be weathertight in closed position.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for installation of doors and frames.

3.4 REPAIR

A. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

B. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.
3.5 ADJUSTING
   A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.6 CLEANING
   A. Clean doors and frames promptly after installation in accordance with manufacturer's instructions.
   B. Do not use harsh cleaning materials or methods that would damage finish.

3.7 PROTECTION
   A. Protect installed doors and frames to ensure that, except for normal weathering, doors and frames will be without damage or deterioration at time of substantial completion.

END OF SECTION 081743
SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Access doors and frames for walls.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, materials, individual components and profiles, and finishes.

B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.

C. Product Schedule: For access door and frame schedule.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

A. Basis-of-Design Product:
   1. J. L. Industries, Inc.; Div. of Activar Construction Products Group

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
   1. Babcock-Davis
   2. Larsen's Manufacturing Company
   3. Milcor Inc.
   4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

D. Exterior Flush Access Doors:
   1. Basis-of-Design Product: Model XTA
ACCESS DOORS AND FRAMES

2. Description: Weatherproof assembly, with face of door fit flush with frame and with exposed frame. Include extruded door gaskets and minimum 2-inch-thick polyisocyanurate insulation.

3. Locations: Wall.

4. Aluminum Sheet for Door: Nominal 0.045-inch, with manufacturer's standard baked-enamel or powder-coat finish.

5. Frame Material: Nominal 0.064-inch, 16-gauge, gavanneled steel with manufacturer's standard baked-enamel or powder-coat finish.


2.2 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879, with cold-rolled steel sheet substrate complying with ASTM A 1008, Commercial Steel (CS), exposed.

C. Metallic-Coated Steel Sheet: ASTM A653, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

D. Aluminum Extrusions: ASTM B221, Alloy 6063.

E. Aluminum Sheet: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

F. Frame Anchors: Same type as door face.

G. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153 or ASTM F 2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.

D. Latching and Lock Hardware:

1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.

2. Keys: Furnish two (2) keys per lock and key all locks alike.
2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
   1. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil for topcoat.
      a. Color: As selected by Architect and Owner from full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes electrically operated sectional doors.

B. Related Sections:
   1. Division 26 Sections for electrical service and connections for powered operators and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.
   1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
   4. Include diagrams for power, signal, and control wiring.

C. Samples: For units with factory-applied finishes.
   1. Include Samples of accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.
1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.


1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including, but not limited to, excessive deflection.
   b. Failure of components or operators before reaching required number of operation cycles.
   c. Faulty operation of hardware.
   d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
   e. Delamination of exterior or interior facing materials.

2. Warranty Period: Ten (10) years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sectional doors from single source from single manufacturer.

1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: As indicated on Drawings and required by the Building Code.
3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.
   
a. Deflection of door in horizontal position (open) shall not exceed 1/120 of the door width.

b. Deflection of horizontal track assembly shall not exceed 1/240 of the door height.


2.3 DOOR ASSEMBLY

A. Steel Sectional Door: Sectional door formed with hinged sections.
   
1. Basis-of-Design Product:
   
a. Overhead Door Corporation; Thermacore 596

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   
a. C.H.I. Overhead Doors
b. Clopay Building Products; a Griffon company
c. Raynor
d. Wayne-Dalton Corp.
e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Operation Cycles: Door components and operators capable of operating for not less than fifty thousand (50,000) cycles. One (1) operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

C. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. at 15 and 25 mph when tested according to ASTM E 283 or DASMA 105.

D. Installed R-Value: 17.40 deg F x h x sq. ft./Btu.

E. Steel Sections: Zinc-coated (galvanized) steel sheet with G90 zinc coating.
   
1. Section Thickness: 2 inches.
2. Face, Steel Sheet Thickness: 20-gauge nominal coated thickness.
   
a. Surface: Manufacturer's standard, flush.

3. Insulation: Foamed in place.

F. Track Configuration: Standard-lift track; 3-inch Heavy-Duty Track

G. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.
H. Windows: Sized and equally spaced apart the approximate distance as indicated on Drawings; in one (1) row at height indicated on Drawings; installed with glazing of the following type:

1. Insulating Glass: **GL-13**, as indicated in Section 088000 “Glazing”.

I. Roller-Tire Material: Case-hardened steel.

J. Locking Devices: Equip door with slide bolt for padlock and chain lock keeper.

K. Counterbalance Type: Torsion spring.


M. Electric Door Operator:

1. Basis-of-Design: **RSX**
2. Usage Classification: Standard duty, up to sixty (60) cycles per hour.
3. Operator Type: Trolley.
4. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
7. Obstruction-Detection Device: Automatic photoelectric sensor and electric sensor edge on bottom bar; self-monitoring type.
   a. Sensor Edge Bulb Color: Black.
8. Control Station: Interior.
9. Other Equipment: Audible and visual signals and radio-control system.

N. Door Finish:

1. Baked-Enamel or Powder-Coat Finish: Color and gloss as selected by Architect and Owner from manufacturer's full range.
2. Finish of Interior Facing Material: Manufacturer's standard, white.

2.4 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Fabricate from zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653, with indicated zinc coating and thickness.

1. Fabricate section faces from single sheets to provide sections not more than 24 inches high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weathertight seal, with a reinforcing flange return.
SECTIONAL DOORS

2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

B. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.064-inch-nominal coated thickness and welded to door section. Provide intermediate stiles formed from not less than 0.064-inch-thick galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches apart.

C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile.

D. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place.

E. Provide reinforcement for hardware attachment.

F. Foamed-in-Place Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polyurethane insulation, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load, and with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

G. Interior Facing Material: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653, with indicated thickness.

H. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

2.6 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances shown on Drawings. Provide complete system including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type, size, weight, and loading.

1. Galvanized Steel: ASTM A 653, minimum G60 zinc coating.
2. Slope tracks at an angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
3. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches apart for door-drop safety device.

a. Vertical Track Assembly: Continuous reinforcing angle attached to track and attached to wall with jamb brackets.
b. Horizontal Track Assembly: Continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.
B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

C. Windows: Manufacturer's standard window units of type, size, and in arrangement indicated. Set glazing in vinyl, rubber, or neoprene glazing channel for metal-framed doors and elastic glazing compound for wood doors, as required. Provide removable stops of same material as door-section frames.

2.7 HARDWARE

A. General: Provide heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch-nominal coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible. Provide double-end hinges where required, for doors over 16 feet wide unless otherwise recommended by door manufacturer.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch-diameter roller tires for 3-inch-wide track and 2-inch-diameter roller tires for 2-inch-wide track.

D. Push/Pull Handles: Equip each push-up operated or emergency-operated door with galvanized-steel lifting handles on each side of door, finished to match door.

2.8 LOCKING DEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks, located on single-jamb side, operable from inside only.

B. Chain Lock Keeper: Suitable for padlock.

C. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.9 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one (1) additional midpoint bracket for shafts up to 16 feet long and two (2) additional brackets at one-third points to support shafts more than 16 feet long unless closer spacing is recommended by door manufacturer.
SECTIONAL DOORS

C. Cables: Galvanized-steel lifting cables with cable safety factor of at least five (5) to one (1).

D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

F. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

2.10 MANUAL DOOR OPERATORS

A. General: Equip door with manual door operator by door manufacturer.

B. Push-up Operation: Lift handles and pull rope for raising and lowering doors, with counterbalance mechanism designed so that required lift or pull for door operation does not exceed 25 lbf.

2.11 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.

1. Trolley: Trolley operator mounted to ceiling above and to rear of door in raised position and directly connected to door with drawbar.

D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements unless otherwise indicated.

1. Electrical Characteristics:
   b. Volts: 120 V.
   c. Hertz: 60.

2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
3. Motor Size: Minimum ½ HP but sized large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.

4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.

5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

6. Use adjustable motor-mounting bases for belt-driven operators.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.

   a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensor device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.

2. Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.

   a. Self-Monitoring Type: Two-wire configured device designed to interface with door-operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure, push-button control labeled "Close."

1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure. Provide with wiring, circuitry and raceways as required.


I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility. Mount signals on interior of building only.

2.12 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.13 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Tracks:

1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches apart.

2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

3. Repair galvanized coating on tracks according to ASTM A 780.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install according to UL 325.
3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weathertight fit around entire perimeter.

D. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 083613
SECTION 083800 - IMPACT TRAFFIC DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes:
      1. Food service doors.
      2. Windows.
      3. Hardware and accessories.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Shop Drawings: Show fabrication and installation details; include door elevations, head, jamb and meeting stile details including full gaskets.

1.4 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For qualified Installer.
   B. Installations Data: Manufacturer's Installation Instructions.
   C. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Minimum five (5) years experience in producing doors of the type specified.
   B. Glazing Publications: Comply with the following published recommendations:
      1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver product in manufacturer's original unopened packages with label legible and intact.

B. Examine doors upon delivery for damage. Verify doors were shipped on edge or in upright position as indicated on packaging by manufacturer.
   1. Note specific doors shipped in other than on edge or upright position on bill of lading and contact manufacturer.

C. Store doors at project site on edge or in upright position and under cover following manufacturer's instructions printed on carton.

1.8 PROJECT CONDITIONS

A. Existing Conditions: Frames installed, under other sections, shall be level and plumb.

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which door manufacturer agrees to replace doors that deteriorate within specified warranty period. Deterioration of doors is defined as defects developed from normal use that are not attributed to door breakage or to maintaining and cleaning doors contrary to manufacturer's written instructions.
   1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Eliason Corporation; SCG-3
   2. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations for Traffic Doors: Obtain traffic doors from single source from single manufacturer.

2.2 DOOR COMPONENTS

A. Doors: ¾-inch exterior grade solid wood core; 1-inch total thickness; medium- to heavy-duty.
   1. Facing: 18-gauge stainless-steel, both sides; stainless-steel top hinge covers.

D. Hinges: Double Action Easy Swing proprietary hinges.

F. Vision Panel: Clear acrylic glazing with black rubber molding.

1. Size: As indicated in the Drawings.

G. Gaskets: Gaskets shall be 60 to 80 durometer extruded black santoprene fitted into matching, pre-formed gasket key and held by friction. Gaskets have wings which seal against rounded edges of the door.

1. Fully Gasketed: Leading edge shall be bulb-type for a single panel. Bulb type gasket is used on the bottom and between the back of the door and jamb. Top seal is a coextruded PVC extrusion with flexible PVC gasket.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory conditions.

C. Commencement of work by installer is acceptance of opening conditions.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Follow manufacturer's instructions. Coordinate sequence of installation with other work to avoid delays.

B. Install doors accurately in their respective frames with clearances, necessary anchors, hardware and accessories according to the manufacturer's data and as specified.

3.4 ADJUSTING

A. Follow manufacturer's instructions as required to:

1. Clean and lubricate operating parts.
2. Adjust to open and close smoothly and freely without binding.
3. Check seals for proper fit.

3.5 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.
B. Touch-up, repair or replace damaged products before Substantial Completion.

C. Remove surplus materials and debris from the site.

END OF SECTION 083800
SECTION 084311 - ALUMINUM-CLAD WOOD-FRAMED FOLDING GLASS STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Sliding-folding aluminum-clad wood-framed glass panel system.

B. Related Requirements:
   1. Section 012300 “Alternates”.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-clad wood-framed storefronts. Include plans, elevations, sections, full-size details, swing panels, direction of swing, stacking layout, and attachments to other work.
   1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   2. Include full-size isometric details of each vertical-to-horizontal intersection, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.
   3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples: For units with factory-applied color finishes.
1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and field-testing agency.

B. Energy Performance Certificates: For aluminum-clad wood-framed storefronts, accessories, and components, from manufacturer.
   1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

C. Product Test Reports: For aluminum-clad wood-framed storefronts, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-clad wood-framed storefronts to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer capable of providing complete, precision built, engineered, pre-fitted units with a minimum twenty-five (25) years’ experience in the sale of folding-sliding door systems for large openings in the North American market.
   1. Manufacturer to have ISO 9001: 2008 quality management system registration.
   2. Manufacturer to have ISO 14001: 2005 environmental management system registration.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer. Installer to provide reference list of at least three (3) projects of similar scale and complexity successfully completed in the last three (3) years.

C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer’s instructions and recommendations and as follows:
   1. Deliver materials to job site in sealed, unopened cartons or crates.
a. Upon receipt, inspect the shipment to ensure it is complete, in good condition and meets project requirements.

2. Condition wood components to average prevailing relative humidity before installation. Do not subject wood components to extreme or rapid changes in heat or humidity.

3. Do not use forced heat to dry out building.

4. Store flat in a well-ventilated area out of direct sunlight under cover in a clean and dry location, protecting units against weather and defacement or damage from construction activities, especially to the edges of panels.

1.9 FIELD CONDITIONS

A. Field Measurements: Contractor to field verify dimensions of rough openings and threshold depressions to receive sill. Mark field measurements on shop drawing submittal.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-clad wood-framed storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including, but not limited to, excessive deflection.
   b. Noise or vibration created by wind and thermal and structural movements.
   c. Deterioration of metals and other materials beyond normal weathering.
   d. Water penetration through fixed glazing and framing areas.
   e. Failure of operating components.

2. Warranty Period for Rollers and Glass Seals: Ten (10) years from date of Substantial Completion.

3. Warranty for all Other Components: Ten (10) years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-clad wood-framed storefronts representing those indicated for this Project
without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-clad wood-framed storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Failure also includes the following:
   
a. Thermal stresses transferring to building structure.
   b. Glass breakage.
   c. Noise or vibration created by wind and thermal and structural movements.
   d. Loosening or weakening of fasteners, attachments, and other components.
   e. Failure of operating units.

B. Structural Loads:

1. Wind and other Design Loads: As indicated on Drawings or per Building Code.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to ¾-inch, whichever is less.

2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8-inch, whichever is smaller.

D. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.

2. When tested at one hundred fifty percent (150%) of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Maximum air leakage of 0.28 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration when tested at a static-air-pressure not less than 5.43 lbf/sq. ft.

G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Product:
   1. NanaWall Systems, Inc.; NanaWall WA67

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Dynamic Architectural Windows and Doors
   2. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Source Limitations: Obtain all components of aluminum-clad wood--framed storefront system, including framing, hardware, and accessories, from single manufacturer.

2.3 COMPONENTS

A. Aluminum-Clad Wood Framed Folding Glass Storefront Description: Manufacturer’s standard exterior aluminum clad solid triple laminated wood frame and panel profiles, with head and floor track, side jambs and panels with dimensions as shown on Drawings.

2. Panel Size (W x H): As indicated on Drawings.
4. Head and Jamb Rail Width: 3-1/16-inch.
5. Bottom Rail Width: 3-1/16-inch.
6. Wood: Cross-grained, triple laminated solid wood with mortise and tenon, and glued and pinned corners. Veneered wood not acceptable.
   a. Species: Manufacturer’s standard.
   b. Finish: Provide factory water-based, open pore base coat applied for paint with one (1) additional clear coat; PT-2, as indicated in Section 090000 “Schedule of Finishes”.

B. Aluminum Extrusion: Attached to interior wood with thermal isolating polyamide connectors using the back-ventilated rainscreen principle.

1. Alloy: AlMgSi0.5; 6063-T5 (F-22 - European standard).
2. Thickness: 0.078-inch nominal.

C. Locking Hardware and Handles:

1. Main Entry Panel(s) for Models WITH a Pair of Swing Panel(s): Provide manufacturer’s standard lever lockset with a lockable latch and multi-point locking with a dead bolt and rods at the top and bottom on primary panel only.
   a. Rods to be concealed and not edge mounted.
b. After turn of key, depression of handles withdraws latch.
c. Lifting of handles engages rods and turn of key or thumb turn engages deadbolt and operates lock.
d. Secondary Swing Panel: Provide matching dummy lever handles on both sides and concealed flush bolts that operate the rods at the top and the bottom for the secondary swing panel.
e. Lever Handle Finish: Oil rubbed bronze solid brass.
f. Locking: Standard profile cylinder.

2. Handle Height: 41-3/8-inch centered from bottom of panel or as otherwise indicated.
3. Aluminum locking rods with fiberglass reinforced polyamide end caps at the top and bottom. Rods to have a stroke of 15/16-inch.
4. Additional profile cylinders to be keyed alike.

D. Sliding-Folding Hardware: Provide manufacturer’s standard combination sliding and folding hardware with top and bottom tracks and threshold. All running carriages to be with sealed, self-lubricating, ball bearing multi-rollers. Surface mounted hinges and running carriages NOT acceptable.

1. For Each Pair of Folding Panels:
   a. Top Hung System: Provide independent cardanic suspension for four (4) wheeled rollers coated with fiberglass reinforced polyamide upper running carriage and lower guide carriage.

2. Sill Type:
   a. Low profile saddle sill (thermally broken).
   b. Finish: Aluminum with a dark bronze anodized finish.
   c. Cover plate over sill NOT acceptable.
   d. For ADA Compliance: Provide gasket to cover the channel in the sill at swing doors.

3. Panel Hinges and Spine: Dark bronze anodized aluminum with hinges connected to spine and NOT directly into wood. Stainless steel security hinge pins with set screws.
4. Adjustment: Provide hinge adjustments of 5/32-inch both in width and in height - up and down, without removing panels from tracks and without needing to remove panels from tracks.

E. Weatherstripping: Manufacturer’s double layer EPDM between panels, EPDM gasket and G-lon gasket, or triple layer EPDM, or brush seal between panel and frame, or brush seals with a two-layer fiberglass reinforced polyamide fin attached at both inner and outer edge of bottom of door panels with a recessed sill or on frame for sealing between panels and between panel and frame.

F. Glazing: GL-13, as indicated in Section 088000 “Glazing”.

2.4 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.
ALUMINUM-CLAD WOOD-FRAMED FOLDING GLASS STOREFRONTS

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding flashing compatible with adjacent materials.

D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.5 FABRICATION

A. Folding Glass Wall: Use solid, three-layer, cross grained frame and panel profiles connected to exterior aluminum extrusions, hinges and spines, sliding and folding hardware, locking hardware and handles, threshold and track, glass and glazing and weatherstripping.
   1. Each unit factory pre-assembled and shipped with complete system components and installation instructions.
   2. Exposed work to be carefully matched to produce continuity of line and design with all joints.
   3. No raw edges visible at joints.
   4. Wood frame and panel components to be sealed with a clear sand sealer or primer plus one (1) additional coat.

2.6 ALUMINUM FINISHES

A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2604 and containing not less than fifty percent (50%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   1. Color and Gloss: As selected by Architect and Owner from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.
7. When lower track is designed to drain, provide connections to allow for drainage.
8. Install panels, handles, lockset, and other accessories in accordance with manufacturer’s recommendations and instructions.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 FIELD QUALITY CONTROL

A. Field Quality-Control Testing:

1. Verify the system operates and functions properly. Adjust hardware for proper operation.

B. Aluminum-clad wood-framed storefronts will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 CLEANING AND PROTECTION

A. Keep units closed and protect installation against damage from construction activities.

B. Remove protective coatings and use manufacturer recommended methods to clean exposed surfaces.

END OF SECTION 084311
SECTION 085200 - WOOD WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes aluminum-clad wood windows.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include construction details, material descriptions, glazing and fabrication methods,
         dimensions of individual components and profiles, hardware, and finishes for wood
         windows.
   B. Shop Drawings: For wood windows.
      1. Include plans, elevations, sections, hardware, accessories, insect screens, operational
         clearances, and details of installation, including anchor, flashing, and sealant installation.
   C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

1.4 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For manufacturer and Installer.
   B. Product Test Reports: For each type of wood window, for tests performed by a qualified testing
      agency.
   C. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE
   A. Manufacturer Qualifications: A manufacturer capable of fabricating wood windows that meet or
      exceed performance requirements indicated and of documenting this performance by test
      reports, and calculations.
   B. Installer Qualifications: An installer acceptable to wood window manufacturer for installation
      of units required for this Project.

1.6 WARRANTY
   A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood windows that fail in
      materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Failure to meet performance requirements.
   b. Structural failures including excessive deflection, water leakage, and air infiltration.
   c. Faulty operation of movable sash and hardware.
   d. Deterioration of materials and finishes beyond normal weathering.
   e. Failure of insulating glass.

2. Warranty Period:
   a. Window: Ten (10) years from date of Substantial Completion.
   b. Glazing Units: Twenty (20) years from date of Substantial Completion.
   c. Aluminum-Cladding Finish: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Source Limitations: Obtain wood windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS
   A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

   1. Window Certification: WDMA certified with label attached to each window.

   B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

      1. Minimum Performance Class: CW.

   C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.

2.3 WOOD WINDOWS
   A. Aluminum-Clad Wood Windows:

      1. Basis of Design:
         a. Marvin Windows and Doors; **Ultimate Next Generation**

      2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         a. Eagle Window & Door, Inc., a subsidiary of Andersen Corporation
b. Jeld-Wen, Inc.
c. Kolbe & Kolbe Millwork Co., Inc.
d. Pella Corporation
e. Weather Shield Manufacturing, Inc.
f. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Operating Types: Provide the following operating types in locations indicated on Drawings:

2. Double hung.

C. Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/L.S.2/A440; kiln dried to a moisture content of not more than twelve percent (12%) at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32-inch-deep by 2 inches wide; water-repellent preservative treated.

   a. Aluminum Finish: Manufacturer's standard fluoropolymer two-coat system with fluoropolymer color topcoat containing not less than seventy percent (70%) polyvinylidene fluoride resin by weight and complying with AAMA 2605.
   b. Color: As selected by Architect and Owner from manufacturer's entire range.

2. Interior Finish: Unfinished.
   a. Wood Species: Manufacturer's standard species.

D. Insulating-Glass Units: ASTM E 2190.

1. Glass: GL-13 and -14, as indicated in Section 088000 “Glazing”.

E. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless-steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: Oil-rubbed bronze.

F. Projected Window Hardware:

1. Operators: Pull handle.
2. Hinges: Manufacturer's standard type for sash weight and size indicated, 180 degree opening.
3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one (1) arm on sashes up to 29 inches tall and two (2) arms on taller sashes.

G. Hung Window Hardware:
1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.

H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

I. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

A. Dividers (False Muntins): Provide divider grilles in designs indicated for each sash lite.

1. Quantity and Type: Two (2) per sash, removable from exposed surfaces at exterior and interior lites, unless otherwise noted.
3. Pattern: As indicated on Drawings.
4. Profile: As selected by Architect and Owner from manufacturer's entire range.
5. Color: To match frame, interior and exterior.

2.5 INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: Full, outside for double-hung sashes.

B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or cope'd joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.

C. Glass-Fiber Mesh Fabric: 18-by-14 or 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.

1. Mesh Color: Manufacturer's standard.

2.6 FABRICATION

A. Fabricate wood windows in sizes indicated. Include a complete system for installing and anchoring windows.
B. Glaze wood windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.
WOOD WINDOWS

END OF SECTION 085200
SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

   a. Swinging doors.

   B. Related Sections:

      1. Section 012300 “Alternates”.
      2. Section 064116 "Plastic-Laminate-Faced Architectural Cabinets" for cabinet door hardware provided with cabinets.

1.3 COORDINATION

A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Inspect and discuss preparatory work performed by other trades.
   3. Review required testing, inspecting, and certifying procedures.

B. Keying Conference: Conduct conference at Project site.

   1. Conference participants shall also include Installer's Architectural Hardware Consultant.
   2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:

      a. Flow of traffic and degree of security required.
      b. Preliminary key system schematic diagram.
      c. Requirements for key control system.
      d. Requirements for access control.
      e. Address for delivery of keys.
1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: For each exposed product in each finish specified, in manufacturer's standard size.
   1. Tag Samples with full product description to coordinate Samples with door hardware schedule.

C. Door Hardware Schedule: Prepared by or under the supervision of Installer. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Shop Drawings, and Samples. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
   2. Format: Use same scheduling sequence and format and use same door numbers as in the door hardware schedule in the Contract Documents.
   3. Content: Include the following information:
      a. Identification number, location, hand, fire rating, size, and material of each door and frame.
      b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
      c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      d. Fastenings and other pertinent information.
      e. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
      f. Mounting locations for door hardware.
      g. List of related door devices specified in other Sections for each door and frame.

D. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

C. Sample Warranty: For special warranty.
1.7 CLOSEOUT SUBMITTALS
A. Maintenance Data: For each type of door hardware to include in maintenance manuals.
B. Schedules: Final door hardware and keying schedule.

1.8 QUALITY ASSURANCE
A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
C. Deliver keys to Owner by registered mail or overnight package service.

1.10 WARRANTY
A. Special Warranty: Manufacturer's agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of doors and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three (3) years from date of Substantial Completion, unless otherwise indicated.
   a. Exit Devices: Two (2) years from date of Substantial Completion.
   b. Manual Closers: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Source Limitations: Obtain each type of door hardware from single manufacturer.
2.2 PERFORMANCE REQUIREMENTS

A. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

B. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

C. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC/ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than ½-inch-high.
4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 3 inches (12 degrees) from the latch.

2.3 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products, where allowed.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2.4 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames

1. Basis of Design:
   a. Stanley Commercial Hardware; a division of Stanley Security Solutions; CB179
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Hager Companies
   b. McKinney Products Company; an ASSA ABLOY Group company
   c. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.5 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in Part 3 “Door Hardware Schedule”.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

C. Lock Backset: 2¼ inches, unless otherwise indicated.

D. Lock Trim:
   1. Levers: Cast.
   2. Escutcheons (Roses): Wrought.
   3. Dummy Trim: Match lever lock trim and escutcheons.

E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

F. Bored Locks: BHMA A156.2; Grade 1; Series 4000.
   1. Basis of Design:
      a. Schlage Commercial Lock Division; an Allegion company; ND Series – Sparta, Vandlgard functions
   2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group Company
      b. Medeco Security Locks, Inc.; an ASSA ABLOY Group company
      c. SARGENT Manufacturing Company; an ASSA ABLOY Group company
      d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2.6 MANUAL FLUSH BOLTS

A. Manual Flush Bolts: BHMA A156.16; minimum ¾-inch throw.

1. Basis-of-Design Product:
   a. Door Controls International, Inc.; 790F, designed for mortising into door edge

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Glynn-Johnson; an Allegion company
   b. IVES Hardware; an Allegion company
   c. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.7 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Basis-of-Design Product:
   a. Von Duprin; an Allegion company; Series 99L and 9927L, 17 trim

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. SARGENT Manufacturing Company; an ASSA ABLOY Group company
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Coordinate exit device operation with cylinder locks where specified.

C. Interior panic hardware shall be cut ½ width of door from latch side only.

2.8 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless-steel, or nickel silver.

   1. Manufacturer: Same manufacturer as for locking devices.

B. Standard Lock Cylinders: BHMA A156.5; Grade 1; permanent cores that are removable; face finished to match lockset.

C. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide ten (10) construction master keys.

2.9 KEYING

1. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a
   great-grand master key operate cylinders.

B. Keys: Brass.

1. Stamping: Permanently inscribe each key with a visual key control number and include
   the following notation:
   a. Notation: "DO NOT DUPLICATE."

2. Quantity: In addition to one (1) extra key blank for each lock, provide the following:

2.10 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf
   release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable
   safety release; and with internal override.

2.11 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and
   latch speeds controlled by key-operated valves and forged-steel main arm. Comply with
   manufacturer's written recommendations for size of door closers depending on size of door,
   exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable
   to meet field conditions and requirements for opening force.

1. Basis-of-Design Product:
   c. LCN; an Allegion company; 4040XP Series

2. Manufacturers: Subject to compliance with requirements, available manufacturers
   offering products that may be incorporated into the Work include, but are not limited to,
   the following:
   a. SARGENT Manufacturing Company; an ASSA ABLOY Group company
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Door closers to have delayed action cylinder, sized to the door leaf size.

1. Marked closer, shall be Smoothee series.
2. Marked closer/stop, shall be Cush-N-Stop series.
3. Marked closer/stop/hold shall be HCush series.

C. Door closers are to be mounted on the least conspicuous side of the door. The hardware
   supplier shall consult with the Architect to verify applications and note mounting locations on
   the hardware schedule.
2.12 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.

1. Basis-of-Design Product:
   a. IVES Hardware; an Allegion company; 407 and 436 or 438

   1) Provide wall bumpers wherever possible. Provide floor stops where the use of wall bumpers is not feasible, provided the location of the stop is not a stumbling hazard or would cause the door to rack at the hinges.

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Glynn-Johnson; an Allegion company
   b. Door Controls International, Inc.
   c. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.13 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Basis-of-Design Product:
   a. Glynn-Johnson; an Allegion company; 90S or H

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Architectural Builders Hardware Mfg., Inc.
   b. Rockwood Manufacturing Company
   c. SARGENT Manufacturing Company; an ASSA ABLOY Group company
   d. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.14 SMOKE SEALS (SMOKE GASKETING)

A. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke ratings indicated, based on testing according to UL 1784.

1. Basis-of-Design Products:
   a. Pemko Manufacturing Co.; an ASSA ABLOY Group company

   1) Smoke Rated Doors:
      a) Head and Jamb: S88C, compression bulb.
      b) Sill: 411APKL, automatic door bottom.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Reese Enterprises, Inc.
   b. Zero International
   c. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.15 WEATHERSTRIPPING (DOOR GASKETING)

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Basis-of-Design Product:
   a. Zero International
      1) Head and Jamb: #328AA, solid neoprene in an extruded aluminum housing.
      2) Sill: #339AA with extruded aluminum housing, solid neoprene.

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. National Guard Products
   b. Pemko Manufacturing Co.; an ASSA ABLOY Group company
   c. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.16 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Basis-of-Design Product:
   a. Pemko Manufacturing Co.; an ASSA ABLOY Group company; 2005AT

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. National Guard Products
   b. Zero International
   c. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.17 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick stainless-steel; with manufacturer’s standard machine or self-tapping screw fasteners.

1. Basis-of-Design Product:
a. Burns Manufacturing Incorporated; **KP50-B4E**

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. IVES Hardware; an Allegion company
   b. Rockwood Manufacturing Company
   c. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

B. All plates are 2 inches less width of door on single doors, 1-inch less width of door on pairs.

   1. Mop Plates: 8 inches high.

2.18 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

      a. Hager Companies
      b. Rockwood Manufacturing Company
      c. Stanley Commercial Hardware; Div. of The Stanley Works
      d. Substitutions: In accordance with Section 012500 “Substitution Procedures”.

2.19 FABRICATION

A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

   2. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
2.20 FINISHES

A. Provide finishes complying with BHMA A156.18. Unless otherwise specified in the hardware sets or specification, materials and finishes for the buildings shall be as follows:

1. BHMA 613, 640, or 710.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one (1) hinge for every
30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying schedule.

E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

F. Stops: Provide wall or floor stops for doors unless other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

H. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

I. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide 6 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.
### DOOR HARDWARE SCHEDULE

A. Provide hardware as specified in the previous articles in sets according to the following schedule and as indicated in the Door Schedule on the Drawings.

1. Refer to Section 012300 “Alternates” for additional information for sets marked with ‘*’.

B. The hardware supplier shall meet with the Architect and/or Owner to determine lock functions and keying requirements.

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**END OF SECTION 087100**
SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes:
   1. Glass for doors and windows.
   2. Glazing sealants and accessories.

1.3 DEFINITIONS
A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
B. Glass Thicknesses: Indicated by thickness designations according to ASTM C 1036.
D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION
A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
C. Glazing Accessory Samples: For gaskets and sealants, in 12-inch lengths. Install sealant Samples between two (2) strips of material representative in color of the adjoining framing system.
D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS
A. Qualification Data: For installers, glass testing agency and sealant testing agency.
B. Product Test Reports: For tinted glass, coated glass, insulating glass, glazing sealants and glazing gaskets.
   1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

C. Preconstruction adhesion and compatibility test report.

D. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
   1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
   2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
   3. Test no fewer than eight (8) Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
   4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.
1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

   1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.11 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

   1. Warranty Period: Ten (10) years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

   1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   1. Cardinal Glass Industries
   2. DuPont™ Building Innovations
   3. Oldcastle BuildingEnvelope
   4. PPG Industries, Inc.
   5. Viracon, Inc.

B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

   1. Obtain tinted glass from single source from single manufacturer.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings or required per Building Code.
2. Maximum Lateral Deflection: For glass supported on all four (4) edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1-inch, whichever is less.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA’s "Glazing Manual."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one (1) component lite of units with appropriate certification label of IGCC.
D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

1. Basis of Design: PPG Industries, Inc.; **SolarGray**.

C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2. For uncoated glass, comply with requirements for Condition A.

3. For coated vision glass, comply with requirements for Condition C (other coated glass).

E. Ceramic-Coated Spandrel Glass: ASTM C 1048, Condition B, Type I, Quality-Q3.


2. Ceramic Coating Color: As selected by Architect and Owner from manufacturer's full range.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

1. Sealing System: Dual seal, with polyisobutylene and silicone primary and secondary.

2. Perimeter Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one (1) of the following:

1. EPDM complying with ASTM C 864.

2. Silicone complying with ASTM C 1115.
3. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

2.7 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

4. Colors of Exposed Glazing Sealants: As selected by Architect and Owner from manufacturer's full range, to match adjacent.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Dow Corning Corporation; 790
   b. Pecora Corporation; 890
   c. Tremco Incorporated; Spectrem 1
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, one hundred percent (100%) solids elastomeric tape; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2.9 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

   a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one (1) continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to
produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

   1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four (4) days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 DECORATIVE FILM SCHEDULE

A. Decorative Film **GL-0**: Not used.

3.9 MONOLITHIC-GLASS SCHEDULE

A. Glass Type **GL-1**: Not used.

B. Glass Type **GL-2**: Clear fully tempered float glass.

   1. Thickness: ¼-inch.
   2. Safety glazing required.

C. Glass Type **GL-3**: Not used.
D. Glass Type GL-4: Not used.

3.10 LAMINATED GLASS SCHEDULE

A. Glass Type GL-5: Not used.
B. Glass Type GL-7: Not used.
C. Glass Type GL-22: Not used.

3.11 INSULATING-GLASS SCHEDULE

A. Glass Type GL-9: Not used.
B. Glass Type GL-10: Not used.
C. Glass Type GL-11: Not used.
D. Glass Type GL-12: Not used.
E. Glass Type GL-13: Low-e-coated, tempered, tinted insulating glass.
   1. Overall Unit Thickness: 1-inch.
   2. Thickness of Each Glass Lite: ¼-inch.
   3. Outdoor Lite: Tinted, fully tempered float glass.
   4. Interspace Content: Argon.
   5. Indoor Lite: Clear, fully tempered float glass.
   7. Safety glazing required.
F. Glass Type GL-14: Ceramic-coated, tinted, tempered, insulating spandrel glass.
   1. Overall Unit Thickness: 1-inch.
   2. Thickness of Each Glass Lite: ¼-inch.
   3. Outdoor Lite: Tinted, fully tempered float glass.
   4. Interspace Content: Argon.
   5. Indoor Lite: Clear, fully tempered float glass.
   7. Provide safety glazing labeling.
G. Glass Type GL-15: Not used.
H. Glass Type GL-16: Not used.
I. Glass Type GL-18: Not used.
J. Glass Type GL-20: Not used.
K. Glass Type GL-25: Not used.
L. Glass Type GL-26: Not used.
M. Glass Type GL-32: Not used.

3.12 INSULATING-LAMINATED-GLASS TYPES

A. Glass Type GL-17: Not used.
B. Glass Type GL-19: Not used.
C. Glass Type GL-21: Not used.
D. Glass Type GL-23: Not used.
E. Glass Type GL-27: Not used.
F. Glass Type GL-28: Not used.
G. Glass Type GL-29: Not used.
H. Glass Type GL-30: Not used.
I. Glass Type GL-31: Not used.

3.13 FIRE-RESISTANCE-RATED GLAZING TYPES

A. Glass Type GL-6: Not used.
B. Glass Type GL-8: Not used.
C. Glass Type GL-24: Not used.
D. Glass Type GL-33: Not used.

END OF SECTION 088000
SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following types of silvered flat glass mirrors:
   1. Tempered glass mirrors qualifying as safety glazing.

B. Related Sections:
   1. Section 102800 "Toilet, Bath, and Laundry Accessories" for metal-framed mirrors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.

B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.

C. Samples: For each type of the following products:
   1. Mirrors: 12 inches square, including edge treatment on two (2) adjoining edges.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For mirrors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: One (1) year from date of manufacture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Donisi Mirror Company
2. Gardner Glass, Inc.
3. Lenoir Mirror Company
4. Virginia Mirror Company, Inc
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.

C. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.

2.2 SILVERED FLAT GLASS MIRRORS

A. Mirrors, General: ASTM C 1503.

B. Tempered Clear Glass: Mirror Glazing Quality, for blemish requirements; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied; clear.
1. Nominal Thickness: 3/8-inch.

C. Safety Glazing Products: For tempered mirrors, provide products that comply with 16 CFR 1201, Category II.

2.3 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

2.4 MIRROR HARDWARE

A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of each mirror in a single piece.

1. Bottom and Side Trim: J-channels formed with front leg and back leg not less than 3/8- and 7/8-inch in height, respectively, and a thickness of not less than 0.04-inch.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) Laurence, C. R. Co., Inc.; CRL Standard "J" Channel
      2) Sommer & Maca Industries, Inc.; Aluminum Shallow Nose "J" Molding Lower Bar
      3) Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2. Top Trim: J-channels formed with front leg and back leg not less than 5/8- and 1-inch in height, respectively, and a thickness of not less than 0.04-inch.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) Laurence, C. R. Co., Inc.; CRL Deep "J" Channel
      2) Sommer & Maca Industries, Inc.; Aluminum Deep Nose "J" Molding Upper Bar
      3) Substitutions: Under provisions of Section 012500 “Substitution Procedures”.


B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide
toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized
anchors and inserts for applications on inside face of exterior walls and where indicated.

2.5 FABRICATION

A. Fabricate mirrors in the shop to greatest extent possible.

B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and
size cutouts so they fit closely around penetrations in mirrors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for
compliance with installation tolerances, substrate preparation, and other conditions affecting
performance of the Work.

B. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic
with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces
are dry.

3.2 PREPARATION

A. Comply with mastic manufacturer's written installation instructions for preparation of
substrates, including coating substrates with mastic manufacturer's special bond coating where
applicable.

3.3 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with
referenced GANA publications. Mount mirrors accurately in place in a manner that avoids
distorting reflected images.

1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips
for the Professional on the Care and Handling of Mirrors."

B. Provide a minimum air space of 1/8-inch between back of mirrors and mounting surface for air
circulation between back of mirrors and face of mounting surface.

C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting
surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install
fasteners so heads do not impose point loads on backs of mirrors.

1. Aluminum J-Channels: Provide setting blocks 1/8-inch-thick by 4 inches long at quarter
points. To prevent trapping water, provide, between setting blocks, two (2) slotted weeps
not less than ¼-inch-wide by 3/8-inch-long at bottom channel.

2. Install mastic as follows:
a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.

b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.

c. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8-inch between back of mirrors and mounting surface.

3.4 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirrors to be exposed to standing water.

C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

D. Clean exposed surface of mirrors not more than four (4) days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300
SECTION 089000 - LOUVERS AND VENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Fixed, extruded-aluminum louvers.

1.3 DEFINITIONS
A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.
   1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
   1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
   2. Show mullion profiles and locations.
C. Samples for Initial Selection: For units with factory-applied color finishes.

1.5 INFORMATIONAL SUBMITTALS
A. Evaluation Reports: For flood vents, from ICC-ES.

1.6 QUALITY ASSURANCE
A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
B. Welding: Qualify procedures and personnel according to the following:


1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain vents from single source from single manufacturer.

2.2 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Drainable-Blade Louver:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Airolite Company, LLC (The)
   b. Arrow United Industries; a division of Mestek, Inc.
   c. Greenheck Fan Corporation
   d. Ruskin Company
   e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2. Louver Depth: 4 inches.
3. Frame and Blade Nominal Thickness: Not less than 0.081-inch.
5. Mullion Type: Fully recessed.
6. Louver Performance Ratings: Refer to Mechanical Drawings.
7. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.3 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Bird screening.

B. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert.

D. Louver Screening for Aluminum Louvers:
   1. Bird Screening: Aluminum, 5/8-inch- square mesh, 0.040-inch wire.

2.4 MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5.
B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
D. Fasteners: Use types and sizes to suit unit installation conditions.
   1. Use Phillips flat-head tamper-resistant screws for exposed fasteners unless otherwise indicated.
   2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
   3. For color-finished louvers, use fasteners with heads that match color of louvers.
E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
   1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.
C. Maintain equal louver blade spacing to produce uniform appearance.
D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
   1. Frame Type: Channel or flange unless otherwise indicated.
E. Include supports, anchorages, and accessories required for complete assembly.
F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.

2. Exterior Corners: Prefabricated corner units with mitered and welded blades and with semi-recessed mullions at corners.

G. Provide subsills made of same material as louvers for recessed louvers.

H. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.7 ALUMINUM FINISHES

A. High-Performance Organic Finish: 2-coat fluoropolymer finish complying with AAMA 2605 and containing not less than seventy percent (70%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: To match adjacent, as selected by Architect and Owner from manufacturer's entire range, including custom colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Install according to manufacturer's written instructions.

B. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.

C. Attach louvers and vents securely in place using fasteners supplied or approved by manufacturer.
D. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

E. Form closely fitted joints with exposed connections accurately located and secured.

F. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

G. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

H. Protect unpainted galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

I. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Test operation of adjustable louvers and vents and adjust as needed to produce fully functioning units that comply with requirements.

B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

D. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089000
### FLOORS:

#### CFT-1

<table>
<thead>
<tr>
<th>Item</th>
<th>Ceramic Tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Creative Material Corporation</td>
</tr>
<tr>
<td>Style</td>
<td>Beckoning</td>
</tr>
<tr>
<td>Color</td>
<td>Dark Gray, Natural Rectified</td>
</tr>
<tr>
<td>Size</td>
<td>12”x24”</td>
</tr>
<tr>
<td>Thickness</td>
<td>3/8”</td>
</tr>
<tr>
<td>Installation</td>
<td>Stacked</td>
</tr>
<tr>
<td>Grout</td>
<td>Proma Grout, Color: Pearl Grey 2</td>
</tr>
<tr>
<td>Location</td>
<td>Toilet Rooms &amp; Locker Room; Refer to Finish Schedule</td>
</tr>
<tr>
<td>Notes</td>
<td>Refer to Section 093000</td>
</tr>
<tr>
<td>Local Rep</td>
<td>Lisa Cupolo 518.701.5720</td>
</tr>
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#### CONC-1

<table>
<thead>
<tr>
<th>Item</th>
<th>Sealed Concrete</th>
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<tbody>
<tr>
<td>Location</td>
<td>Refer to Finish Schedule</td>
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<tr>
<td>Notes</td>
<td>Refer to Section 099123</td>
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#### CPT-1

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<tr>
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<tbody>
<tr>
<td>Manufacturer</td>
<td>J+J Invisions</td>
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<tr>
<td>Style</td>
<td>Sashiko</td>
</tr>
<tr>
<td>Color</td>
<td>Decorative</td>
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<td>Size</td>
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<tr>
<td>Installation</td>
<td>Ashlar</td>
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<tr>
<td>Location</td>
<td>Conference Room 011; Refer to Finish Schedule</td>
</tr>
<tr>
<td>Notes</td>
<td>Refer to Section 096813</td>
</tr>
<tr>
<td>Local Rep</td>
<td>Rob Fortier 860.881.1540</td>
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#### CPT-2

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<thead>
<tr>
<th>Item</th>
<th>Carpet Tile</th>
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<tr>
<td>Manufacturer</td>
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<tr>
<td>Style</td>
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<tr>
<td>Color</td>
<td>Village 72760</td>
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<tr>
<td>Size</td>
<td>24”x24”</td>
</tr>
<tr>
<td>Installation</td>
<td>Ashlar</td>
</tr>
<tr>
<td>Location</td>
<td>Pro Shop 015 &amp; Corridor 2 &amp; 3; Refer to Finish Schedule</td>
</tr>
<tr>
<td>Notes</td>
<td>Provide 20% attic stock; Refer to Section 096813</td>
</tr>
<tr>
<td>Local Rep</td>
<td>Rick Gondon 860.209.0698</td>
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<tr>
<td>Item</td>
<td>Item: Kitchen Safety Flooring</td>
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<tr>
<td>------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Alto</td>
</tr>
<tr>
<td>Style:</td>
<td>Stronghold 30</td>
</tr>
<tr>
<td>Color:</td>
<td>Tundra K30500</td>
</tr>
<tr>
<td>Thickness:</td>
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<tr>
<td>Location:</td>
<td>Kitchen; Refer to Finish Plans</td>
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<tr>
<td>Notes:</td>
<td>Heat weld, 6” integral cove base; Provide sanitary sealant between base and WWP-1, Refer to Detail on A940; Refer to Section 096516</td>
</tr>
<tr>
<td>Local Rep:</td>
<td>Carol Polyviou 203.915.9163</td>
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<tr>
<th>Item</th>
<th>Item: Luxury Vinyl Tile</th>
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<td>Manufacturer:</td>
<td>Armstrong</td>
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<tr>
<td>Style:</td>
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<td>Antiqued Oak Natural PC003</td>
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<td>5” x 48”</td>
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<td>Thickness:</td>
<td>20 mil wear layer</td>
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<td>Installation:</td>
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<tr>
<td>Location:</td>
<td>Refer to Finish &amp; Floor Pattern Plan; Refer to Finish Schedule</td>
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<tr>
<td>Notes:</td>
<td>Glue Down Application; Refer to Section 096519</td>
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<tr>
<td>Local Rep:</td>
<td>Roanne Marquardt 203.868.7811</td>
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<tr>
<th>Item</th>
<th>Item: Static Dissipative Sheet Flooring</th>
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<td>Manufacturer:</td>
<td>Johnsonite</td>
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<tr>
<td>Style:</td>
<td>Granit-SD</td>
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<td>Misty 0714</td>
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<td>Thickness:</td>
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<td>Location:</td>
<td>IT 012; Refer to Finish Schedule</td>
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<td>Notes:</td>
<td>Heat weld, 6” integral cove base; Provide vinyl cove cap and Cover Filler Strip CFS-00-A; Refer to Section 096536</td>
</tr>
<tr>
<td>Local Rep:</td>
<td>Carrie Bartucca 860.305.2599</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Item: Walk-Off Mat</th>
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<tbody>
<tr>
<td>Manufacturer:</td>
<td>Mats Inc.</td>
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<tr>
<td>Style:</td>
<td>Calypso Tile</td>
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<td>Color:</td>
<td>Chestnut</td>
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<tr>
<td>Thickness:</td>
<td>3/8”</td>
</tr>
<tr>
<td>Size:</td>
<td>19-11/16” x 19-11/16”</td>
</tr>
<tr>
<td>Installation:</td>
<td>Glued Down; Quarter-Turned</td>
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<tr>
<td>Location:</td>
<td>Refer to Finish Plans</td>
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<tr>
<td>Notes:</td>
<td>Provide aluminum edge trim around adhered mats in Corridor 2 &amp; 3 (FTS-1); Refer to Section 124813</td>
</tr>
<tr>
<td>Local Rep:</td>
<td>800.MATS.INC</td>
</tr>
</tbody>
</table>
### SADDLE/FLOOR TRANSITIONS:

**FTS-1**
- **Item:** Metal Transition Strip
- **Manufacturer:** Schluter
- **Style:** Schiene
- **Finish:** Stainless-Steel 304
- **Size:** 3/8”
- **Notes:** To be used at transitions between WOM to CPT; Refer to Section 093000
- **Local Rep:** Lucia Franco 203.230.8315

**FTS-2**
- **Item:** Metal Transition Strip
- **Manufacturer:** Schluter
- **Style:** Schiene
- **Finish:** Stainless-Steel 304
- **Size:** 3/8”
- **Notes:** To be used at transitions between LVT to CFT where slab is dropped for flush transition & CFT to CFT; Refer to Section 093000
- **Local Rep:** Lucia Franco 203.230.8315

**FTS-3**
- **Item:** Marble Threshold
- **Manufacturer:** Daltile
- **Notes:** To be used at door transitions between Toilet Rooms 005 & 006 only; Refer to Section 093000
- **Local Rep:** Lucia Franco 203.230.8315

**FTS-4**
- **Item:** Metal Edge Strip
- **Manufacturer:** Schluter Systems
- **Style:** RENO-RAMP
- **Finish:** Satin Anodized Aluminum
- **Size:** 3/8”
- **Notes:** To be used at transitions between the following: CFT to CONC-1; Refer to Section 093000
- **Local Rep:** Lucia Franco 203.230.8315

**FTS-5**
- **Item:** Rubber Transition Strip
- **Manufacturer:** Johnsonite
- **Style:** EG-XXX-H
- **Notes:** To be used at transitions between the following: CFT-2 to CPT (concrete slab to be recessed at CFT-2; refer to construction floor plan); Refer to Section 096513
- **Local Rep:** Carrie Bartucca 860.305.2599
SCHEDULE OF FINISHES

FTS-6
Item: Rubber Transition Strip
Manufacturer: Johnsonite
Style: T Molding, CE-XXX-A
Finish: To match RB-1
Notes: To be used at transitions between the following: LVT to CPT; Refer to Section 096513
Local Rep: Carrie Bartucca 860.305.2599

FTS-7
Item: Aluminum Saddle Threshold
Manufacturer: Pemko
Style: 173A
Finish: Mill
Notes: To be used at transitions between the following: KSF-1 to LVT-1; Refer to Section 087100

BASE:
CG-1
Item: Wood Corner Guard
Color: Painted PT-2
Location: Corridors
Notes: Refer to Details on A940; Refer to Section 062023

CM-1
Item: Wood Crown Molding
Color: Painted PT-2
Size: 6”
Location: Pro Shop & Corridor 1
Notes: Refer to Finish Schedule and Details on A940; Refer to Section 062023

CWB-1
Item: Ceramic Wall Base
Manufacturer: Creative Materials Corp
Style: Beckoning
Color: Dark Gray, Natural
Size: 4”x12”
Thickness: 3/8”
Grout: Proma Grout, Color: Pearl Grey 2
Location: Toilet Rooms & Locker Room; Refer to Finish Schedule
Notes: Provide Schluter Rondec-DB, DB14AE on non-tiled walls; Refer to Section 093000
Local Rep: Lisa Cupolo 518.701.5720
<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
<th>Manufacturer</th>
<th>Color</th>
<th>Size</th>
<th>Location</th>
<th>Notes</th>
<th>Local Rep</th>
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<tbody>
<tr>
<td>RB-1</td>
<td>Rubber Base</td>
<td>Johnsonite</td>
<td>Welsh Castle TA8</td>
<td>6”</td>
<td>See Finish Schedule</td>
<td>Coiled; Refer to Section 096513</td>
<td>Carrie Bartucca 860.305.2599</td>
</tr>
<tr>
<td>RB-2</td>
<td>Rubber Base</td>
<td>Johnsonite</td>
<td>47 Brown</td>
<td>4”</td>
<td>See Finish Schedule</td>
<td>Coiled; Trophy Refer to Section 096513</td>
<td>Carrie Bartucca 860.305.2599</td>
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<tr>
<td>WB-1</td>
<td>Wood Base</td>
<td>Painted PT-2</td>
<td>6”</td>
<td>General</td>
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<td>Refer to Base Details on A940; Refer to Section 062023</td>
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<td>WB-2</td>
<td>Wood Base</td>
<td>Painted PT-2</td>
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<td>Corridor 1; Refer to Casework Details</td>
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<td>Refer to Section 062023</td>
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<tr>
<td>WB-3</td>
<td>Wood Base</td>
<td>Stained to match PL-1</td>
<td>4”</td>
<td>Bar</td>
<td></td>
<td>Refer to Section 062023</td>
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**WALLS:**

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<thead>
<tr>
<th>Item</th>
<th>Item</th>
<th>Manufacturer</th>
<th>Style</th>
<th>Finish</th>
<th>Size</th>
<th>Location</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>AWP-1</td>
<td>Acoustical Wall Panel</td>
<td>Armstrong</td>
<td>Soundsoak 85</td>
<td>Fabric-wrapped, Mayer, Fedora 621, Color: Winter 621-007</td>
<td>2” thick; Refer to Interior Elevations</td>
<td>Dining Room</td>
<td>Square Edge; Fabric to be railroaded with no seams; Refer to Section 098433</td>
</tr>
</tbody>
</table>
CWT-1

Item: Ceramic Tile  
Manufacturer: Creative Materials Corp  
Style: Brixton  
Color: White Glossy  
Size: 3” x 12”  
Grout: Proma Grout, Color: Pearl Grey 2  
Location: Toilet Rooms; Refer to Finish Schedule  
Notes: Refer to Section 093000  
Local Rep: Lisa Cupolo 518.701.5720

EP-1

Item: Epoxy Paint  
Manufacturer: Benjamin Moore  
Color: Balboa Mist 1549  
Finish: Eggshell  
Location: Toilet Rooms; Refer to Finish Schedule  
Notes: Refer to Section 099600  
Local Rep: Amy Figueroa 201.995.3647

PT-1

Item: Paint  
Manufacturer: Benjamin Moore  
Color: Tapestry Beige OC-32  
Finish: Eggshell  
Location: General Wall Paint  
Notes: Refer to Section 099123  
Local Rep: Amy Figueroa 201.995.3647

PT-2

Item: Paint  
Manufacturer: Benjamin Moore  
Color: Simply White OC-117  
Finish: Flat on Ceiling; Semi-Gloss on Doors/Trim  
Location: General Trim Paint & Ceiling Paint; Coordinate with PT-4 on doors to receive separate front/back colors  
Notes: Refer to Section 099123  
Local Rep: Amy Figueroa 201.995.3647

PT-3

Item: Paint  
Manufacturer: Benjamin Moore  
Color: Mount Saint Anne 1565  
Finish: Eggshell  
Location: Accent Paint; Refer to Finish Schedule and Finish & Floor Pattern Plans for Locations  
Notes: Refer to Section 099123  
Local Rep: Amy Figueroa 201.995.3647
<table>
<thead>
<tr>
<th>Item</th>
<th>Manufacturer</th>
<th>Color</th>
<th>Finish</th>
<th>Location</th>
<th>Notes</th>
<th>Local Rep</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-4</td>
<td>Paint</td>
<td>Benjamin Moore</td>
<td>Briarwood PM-32</td>
<td>Semi-Gloss</td>
<td>Doors/Frames on same side of rooms with RB-1, Refer to Finish Schedule and Finish &amp; Floor Pattern Plans for Locations</td>
<td>Refer to Section 099123</td>
</tr>
<tr>
<td>PWT-1</td>
<td>Porcelain Wall Tile</td>
<td>Daltile</td>
<td>Emerson Wood – 3D Cube</td>
<td>EP04 Balsam Fir</td>
<td>11½” x 11½” Sheet; Proma Grout, Color: Winter Sky 45</td>
<td>Refer to Section 093000</td>
</tr>
<tr>
<td>WC-1</td>
<td>Wallcovering</td>
<td>D.L. Couch</td>
<td>Preservation (Magnolia Home)</td>
<td>Ash MAG1092</td>
<td>54” Width</td>
<td>Conference Room; Refer to Finish Plan for location and Finish Schedule</td>
</tr>
<tr>
<td>WP-1</td>
<td>Wainscot Paneling</td>
<td>Ship Lap</td>
<td>Painted PT-2</td>
<td>All walls in Corridor 1; See Interior Elevations</td>
<td>Refer to Section 062023</td>
<td></td>
</tr>
<tr>
<td>WPP-1</td>
<td>Wall Protection Panel</td>
<td>Altro</td>
<td>Puraguard</td>
<td>White</td>
<td>4’ x 8’ or 4’ x 10’</td>
<td>Kitchen</td>
</tr>
</tbody>
</table>
### CASEWORK:

**PL-1**
- **Item:** Plastic Laminate  
- **Manufacturer:** Lab Designs  
- **Color:** Midnight Forest WS366  
- **Location:** Refer to Details on Drawing and Interior Elevations  
- **Notes:** Contractor to plan accordingly for potential long lead time; Refer to Section 064116  
- **Local Rep:** Nancy Royer 203.654.3995

**PL-2**  
Not Used

**PL-3**
- **Item:** Plastic Laminate  
- **Manufacturer:** Lab Designs  
- **Color:** London Woodland WA205 TX  
- **Location:** Toilet Room Casework & Pro Shop 015 Casework; Refer to Details on Drawing  
- **Notes:** Contractor to plan accordingly for potential long lead time; Refer to Section 064116  
- **Local Rep:** Nancy Royer 203.654.3995

**SS-1**
- **Item:** Solid Surface  
- **Manufacturer:** Corian  
- **Style:** Carbon Concrete  
- **Location:** Horizontal Surfaces at Casework except Bar; Refer to Details on Drawings  
- **Notes:** Refer to Section 123661.16

**WT-1**
- **Item:** Wood Countertop  
- **Color:** Stained to match PL-1  
- **Location:** Horizontal surfaces at bar; Refer to Details on Drawings  
- **Notes:** Refer to Section 123619

### CEILINGS:

**ACT-1**
- **Item:** Acoustic Ceiling Tile  
- **Manufacturer:** Armstrong  
- **Style:** Calla  
- **Size:** 2’ x 2’  
- **Color:** White  
- **Location:** Refer to Reflected Ceiling Plan and Finish Schedule  
- **Notes:** Square Tegular 9/16”; Silhouette XL 1/8” Reveal Suspension System; Refer to Section 095113  
- **Local Rep:** Amanda Carlson 203.464.2682
ACT-2

<table>
<thead>
<tr>
<th>Item:</th>
<th>Acoustic Ceiling Tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer:</td>
<td>Armstrong</td>
</tr>
<tr>
<td>Style:</td>
<td>Ultima Health Zone</td>
</tr>
<tr>
<td>Size:</td>
<td>2’ x 2’</td>
</tr>
<tr>
<td>Color:</td>
<td>White</td>
</tr>
<tr>
<td>Location:</td>
<td>Storage, Kitchen &amp; Kitchen Office; Refer to Reflected Ceiling Plan and Finish Schedule</td>
</tr>
<tr>
<td>Notes:</td>
<td>Square Lay-In 15/16”; Prelude Suspension System; Refer to Section 095113</td>
</tr>
<tr>
<td>Local Rep:</td>
<td>Amanda Carlson 203.464.2682</td>
</tr>
</tbody>
</table>

MISCELLANEOUS:

SW-1

<table>
<thead>
<tr>
<th>Item:</th>
<th>Slatwall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer:</td>
<td>Barr Display</td>
</tr>
<tr>
<td>Color:</td>
<td>#2843 Rustic Gray Slatwall w/Metal Inserts</td>
</tr>
<tr>
<td>Location:</td>
<td>Pro Shop 015</td>
</tr>
<tr>
<td>Notes:</td>
<td>Provide matching edge cap on ALL edges; Refer to Interior Elevations for sizes; Provide matching melamine wood shelves as shown on Interior Elevations (widths: 48”W and 24”W); Refer to Section 097700</td>
</tr>
</tbody>
</table>

WINDOW TREATMENTS

WT-1

<table>
<thead>
<tr>
<th>Item:</th>
<th>Manual Roller Shades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer:</td>
<td>Draper</td>
</tr>
<tr>
<td>Style:</td>
<td>Vizela 1% Openness</td>
</tr>
<tr>
<td>Color:</td>
<td>MV-623 Sahel</td>
</tr>
<tr>
<td>Location:</td>
<td>Pro Shop 015</td>
</tr>
<tr>
<td>Note:</td>
<td>PVC-FREE material only, 100% fiberglass shade fabric; Refer to Section 122413</td>
</tr>
</tbody>
</table>

END OF SECTION 090000
SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Interior gypsum board.

B. Related Requirements:
   1. Section 093000 "Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:
   1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Georgia-Pacific Gypsum LLC
2. National Gypsum Company
3. USG Corporation
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Abuse-Resistant Gypsum Board: ASTM C 1629.

1. Core: As indicated on Drawings.
2. Surface Abrasion: Meets or exceeds Level 3 requirements.
3. Surface Indentation: Meets or exceeds Level 1 requirements.
4. Single-Drop Soft-Body Impact: Meets or exceeds Level 1 requirements.
5. Long Edges: Tapered.
6. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

C. Mold (Moisture)-Resistant Gypsum Board: ASTM C 1396. With moisture- and mold-resistant core and paper surfaces.

1. Core: As indicated on Drawings.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
   a. Cornerbead.
   b. Bullnose bead.
   c. LC-Bead: J-shaped; exposed long flange receives joint compound.
   d. L-Bead: L-shaped; exposed long flange receives joint compound.
   e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
   3. Fill Coat: For second coat, use drying-type, all-purpose compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

D. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Pecora Corporation; AC-20 FTR
      b. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant
      c. USG Corporation; SHEETROCK Acoustical Sealant
      d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow ¼- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide ¼- to ½-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
I. **STC-Rated Assemblies:** Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board where indicated on Drawings.

B. **Single-Layer Application:**

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels in most economical direction, with ends and edges occurring over firm bearing unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### 3.4 INSTALLING TRIM ACCESSORIES

A. **General:** For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. **Control Joints:** Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. **Interior Trim:** Install in the following locations:

1. **Cornerbead:** Use at outside corners, unless otherwise indicated.
2. **Bullnose Bead:** Use at outside corners.
3. **LC-Bead:** Use at exposed panel edges.
4. **L-Bead:** Use where indicated.
5. **U-Bead:** Use at exposed panel edges.

### 3.5 FINISHING GYPSUM BOARD

A. **General:** Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 4: At panel surfaces that will be exposed to view, receiving wallcoverings and flat paints.
   a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

2. Level 5: At panel surfaces that will be exposed to view, receiving eggshell, gloss and semi-gloss enamels.
   a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900
SECTION 093000 - TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Porcelain tile.
   2. Glazed wall tile.
   4. Tile backing panels.
   5. Crack isolation membrane.
   6. Metal edge strips.
B. Related Requirements:
   1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 DEFINITIONS
A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.4 PREINSTALLATION MEETINGS
A. Preinstallation Conference: Conduct conference at Project site.
   1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
C. Samples for Verification:
   1. Full-size units of each type and composition of tile and for each color and finish required. For porcelain mosaic tile in color blend patterns, provide full sheets of each color blend.
   2. Full-size units of each type of trim and accessory for each color and finish required.
   4. Metal edge strips in 6-inch lengths.

1.6 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For Installer.
   B. Product Test Reports: For tile-setting and -grouting products and certified porcelain tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS
   A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Tile and Trim Units: Furnish quantity of full-size units equal to three percent (3%) of amount installed for each type, composition, color, pattern, and size indicated.
      2. Grout: Furnish quantity of grout equal to three percent (3%) of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE
   A. Installer Qualifications:
      1. Installer employs installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.
   B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
      1. Build mockup of each type of floor tile installation.
      2. Build mockup of each type of wall tile installation.
      3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING
   A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
   B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
   C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
   D. Store liquid materials in unopened containers and protected from freezing.
1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer’s written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AKDO
2. Alfalux
3. American Olean Corporation
4. Creative Material Corporation
5. Crossville, Inc.
6. Dal-Tile Corporation
7. Florim USA
8. Garden State Tile
9. Marazzi
10. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

C. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
2. Obtain crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.

D. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:

1. Stone thresholds.
2. Crack isolation membrane.
3. Metal edge strips.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
1. Provide tile complying with Standard grade requirements.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

2.3 TILE PRODUCTS

A. Tile Type: Unglazed porcelain floor tile.

1. Basis-of-Design Product:
   a. Creative Material Corporation (CFT-1)

2. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
3. Face: Plain with square or cushion edges.
   a. Wet: Not less than 0.42.

5. Face Size, Thickness, Tile Color and Pattern and Grout Color: As indicated in Section 090000 “Schedule of Finishes”.
6. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
   a. Base (CWB-1): Module size and model as indicated in Section 090000 “Schedule of Finishes”.
   b. External Corners: Module size same as adjoining flat tile.
   c. Internal Corners: Field-butted square corners.

B. Tile Type: Glazed wall tile.

1. Basis-of-Design Product:
   a. Creative Materials Corporation (CWT-1)
   b. Dal-Tile Corporation (PWT-1)

2. Face: Plain with modified square edges or cushion edges.
3. Module Size, Thickness, Finish, Tile Color and Pattern and Grout Color: As indicated in Section 090000 “Schedule of Finishes”.
4. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
   c. External Corners: Surface bullnose, same size as adjoining flat tile.
   d. Internal Corners: Field-butted square corners.

2.4 THRESHOLDS (FTS-2)

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16-inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2-inch or less above adjacent floor surface.

B. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 10 per ASTM C 1353 or ASTM C 241 and with honed finish.

1. Description: Uniform, fine- to medium-grained stone in color as selected by Architect and Owner.

2.5 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, Type A, in maximum lengths available to minimize end-to-end butt joints.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Custom Building Products; Wonderboard
   b. FinPan, Inc.; Util-A-Crete Concrete Backer Board
   c. James Hardie Building Products, Inc.; HardieBacker Cement Board
   d. USG Corporation; DUROCK Cement Board
   e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2. Thickness: As indicated on Drawings.

2.6 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Chlorinated Polyethylene Sheet: Non-plasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch nominal thickness.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Noble Company (The); Nobleseal CIS
   b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2.7 SETTING MATERIALS

A. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.
   1. Basis-of-Design Product:
      a. Laticrete International, Inc.
   2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Bostik, Inc.
      b. Custom Building Products
      c. MAPEI Corporation
      d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
   3. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
   4. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.

2.8 GROUT MATERIALS

A. Basis-of-Design Product:
   1. PROMA Adhesives, Inc.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Bostik, Inc.
   2. Custom Building Products
   3. Laticrete International, Inc.
   4. MAPEI Corporation
   5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Water-Cleanable Epoxy Grout: ANSI A118.3.
   1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by manufacturer for intended use.

2.9 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for floor, stair or wall applications.
1. Basis-of-Design Product:
   a. Schluter Systems L.P.

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Blanke Corporation
   b. Ceramic Tool Company, Inc.
   c. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

3. Size and Finish: CWT-1 and FTS-, as indicated in Section 090000 “Schedule of Finishes”.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Bonsal American, an Oldcastle company; Grout Sealer
   b. Custom Building Products; Grout Sealer
   c. TEC, H. B. Fuller Construction Products Inc.; Guard All Invisible Penetrating Sealer
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.10 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
   a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
   b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer. Expect and include in the Base Bid the requirement to apply and machine level at least three (3) coats of leveler in all spaces.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped ¼-inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
   1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
   2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
   3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

F. Joint Widths: Unless otherwise indicated or recommended by manufacturer, install tile with the following joint widths:
   2. Glazed Wall Tile: 1/16-inch.

G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

I. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
   1. Do not extend crack isolation membrane under thresholds set in latex-Portland cement mortar. Fill joints between such thresholds and adjoining tile set on crack isolation membrane with elastomeric sealant.

J. Metal Edge Strips: Install at locations indicated.

K. Grout Sealer: Apply grout sealer to grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 TILE BACKING PANEL INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use Latex-Portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.
3.5 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

3.6 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than ten (10) days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.7 PROTECTION

A. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven (7) days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.8 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:


   b. Grout: Water-cleanable epoxy grout.

B. Interior Wall Installations, Wood or Metal Studs or Furring:

1. Ceramic Tile Installation (CWT): TCNA W2443; thin-set mortar on gypsum board.

   b. Grout: Water-cleanable epoxy grout.
END OF SECTION 093000
SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes acoustical panels and exposed suspension systems for ceilings.
   B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling
      attachment devices to be cast in concrete.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

1.4 INFORMATIONAL SUBMITTALS
   A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items
      are shown and coordinated with each other, using input from installers of the items involved:
      1. Suspended ceiling components.
      2. Structural members to which suspension systems will be attached.
      3. Size and location of initial access modules for acoustical panels.
      4. Items penetrating finished ceiling including the following:
         a. Lighting fixtures.
         b. Air outlets and inlets.
         c. Speakers.
         d. Sprinklers.
         e. Access panels.
      5. Perimeter moldings.
   B. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified
      testing agency.
   C. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and
      fastener type, from ICC-ES.

1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For finishes to include in maintenance manuals.
1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to two percent (2%) of each type of quantity installed.
2. Suspension-System Components: Quantity of each exposed component equal to two percent (2%) of quantity installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than forty-eight (48) hours before beginning acoustical panel ceiling installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: Fifty (50) or less.

C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

B. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15¾ inches away from test surface according to ASTM E 795.

C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANEL MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. USG Interiors, Inc.; Subsidiary of USG Corporation.
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.4 ACOUSTICAL PANELS

A. Basis-of-Design Product (ACT-1):

1. Armstrong World Industries, Inc.; Calla
2. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
   a. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 2, water felted; with vinyl overlay on face, back, and sealed edges.
   b. Pattern: E (lightly textured).

3. LR: Not less than 0.86.
4. NRC: Not less than 0.85.
5. Thickness: 1-inch.
6. Color, Edge/Joint Detail, and Modular Size: As indicated in Section 090000 “Schedule of Finishes”.

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H. Smith Richardson Golf Course Clubhouse – Fairfield
095113-3
B. Basis-of-Design Product (ACT-2):

1. Armstrong World Industries, Inc.; **Ultima Health Zone**
2. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
   a. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 2, water felted; with vinyl overlay on face, back, and sealed edges.
   b. Pattern: E (lightly textured).
4. LR: Not less than 0.86.
5. NRC: Not less than 0.70.
6. CAC: Not less than 38.
8. Color, Edge/Joint Detail, and Modular Size: As indicated in Section 090000 “Schedule of Finishes”.

C. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.5 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

B. Attachment Devices: Size for five (5) times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three (3) times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch-diameter wire.

D. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

E. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
F. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

2.6 METAL SUSPENSION SYSTEM

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. USG Interiors, Inc.; Subsidiary of USG Corporation.
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Wide-Face, Double-Web, Hot-Dip Galvanized, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized according to ASTM A 653; with prefinished, cold-rolled, 15/16-inch-wide flanges.

1. Basis-of-Design Product:
   a. Armstrong World Industries, Inc.; **Prelude XL 15/16-Inch Exposed Tee System**

2. Structural Classification: Heavy-duty system.
3. Face Design: Flat, flush.

C. Narrow-Face, Double-Web, Hot-Dip Galvanized, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized according to ASTM A 653; with prefinished, cold-rolled, 9/16-inch-wide flanges.

1. Basis-of-Design Product:
   a. Armstrong World Industries, Inc.; **Silhouette XL 1/8” Reveal System**

2. Structural Classification: Heavy-duty system.
5. Reveal Finish: Painted white.

2.7 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. USG Interiors, Inc.; Subsidiary of USG Corporation.
4. Substitutions: Under provisions of Division 01 Section “Substitution Procedures”.

B. Roll-Formed, Sheet-Metal Edge Moldings: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design
ACOUSTICAL PANEL CEILINGS

requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.8 ACOUSTICAL SEALANT

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
   a. Pecora Corporation; **AC-20 FTR Acoustical and Insulation Sealant**
   b. USG Corporation; **SHEETROCK Acoustical Sealant**
   c. Substitutions: Under provisions of Division 01 Section “Substitution Procedures”.

B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

   1. Exposed and Concealed Joints: Non-sag, paintable, non-staining latex sealant.
   2. Acoustical sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three (3) tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four (4) tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
3. Install clean-room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.
4. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113
SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Resilient base.
      2. Resilient molding accessories.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
   C. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS
   A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS
   A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
      1. 48 hours before installation.
      2. During installation.
      3. 48 hours after installation.
B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 WARRANTY

A. Provide manufacturer's written limited warranties against defects in materials and against premature wear prior to warranty expiration for the materials as follows:

1. Resilient Base: Two (2) years.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

A. Conform to Class I rating with a flame spread of 0 to 25 in accordance with the requirements of Class A material in accordance with ASTM E 84. Rubber products shall be Class I, 0.45 watts/sq. cm in accordance with ASTM E 648 and NFPA 255.

2.2 THERMOPLASTIC-RUBBER BASE

A. Basis of Design:

1. Johnsonite; A Tarkett Company; Traditional

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
2. Mannington Mills, Inc.
3. Roppe Corporation, USA
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

2. Style: B, Cove.

D. Outside and Inside Corners: Preformed.

E. Thickness, Height, Length and Colors: RB-, as indicated in Section 090000 “Schedule of Finishes”.

2.3 RUBBER MOLDING ACCESSORY

A. Basis of Design:

1. Johnsonite; A Tarkett Company
B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
2. Roppe Corporation, USA.
3. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Description: Rubber transitions strips, moldings, edge guards and reducers.

D. Profile and Dimensions: As indicated on Drawings and as required for installation.

E. Locations: Provide rubber molding accessories in areas indicated and where required.

F. Colors and Patterns: FTS-5 and -6, as indicated in Section 090000 “Schedule of Finishes”.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
C. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513
SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Vinyl sheet flooring with backing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of resilient sheet flooring.
   1. Include sheet flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   2. Show details of special patterns.

C. Samples: For each exposed product and for each color, texture, and pattern specified in manufacturer's standard size, but not less than 6-by-9-inch sections.
   1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

D. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

E. Product Schedule: For resilient sheet flooring. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Resilient Sheet Flooring: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient sheet flooring during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during resilient sheet flooring installation.

D. Close spaces to traffic for 48 hours after resilient sheet flooring installation.

E. Install resilient sheet flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
2.2 VINYL SHEET FLOORING WITH BACKING

A. Basis of Design:

1. Altro USA

B. Products: Subject to compliance with requirement, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.
2. Forbo Industries, Inc.
3. Johnsonite; a Tarkett company
4. Mannington Mills, Inc.
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.


1. Type (Binder Content): Type I, minimum binder content of ninety percent (90%).
2. Wear-Layer Thickness: Grade 1.
3. Interlayer Material: None.

D. Wearing Surface: Embossed with embedded abrasives.

1. Slip resistant with a minimum Coefficient of Friction of 0.88 (dry) and 1.0 (wet) on level surface.

E. Sheet Width: As standard with manufacturer.


G. Thickness, Colors and Patterns: KSF-1, as indicated in Section 090000 “Schedule of Finishes”.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.

1. Adhesives shall have a VOC content of 60 g/L or less.

C. Seamless-Installation Accessories:


D. Integral-Flash-Cove-Base Accessories:
1. Cove Strip: 1-inch radius provided or approved by resilient sheet flooring manufacturer.
2. Corners: Metal inside and outside corners and end stops provided or approved by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three (3) tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum eighty percent (80%) relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate. Expect and include in the Base Bid the requirement to apply and machine level at least three (3) coats of leveler in all spaces.

D. Do not install resilient sheet flooring until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.3 RESILIENT SHEET FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient sheet flooring.

B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.

C. Lay out resilient sheet flooring as follows:

1. Maintain uniformity of flooring direction.
2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
3. Match edges of flooring for color shading at seams.
4. Avoid cross seams.

D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

H. Seamless Installation:

1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.

I. Integral-Flash-Cove Base: Cove vinyl sheet flooring 6 inches up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

1. Install metal corners at inside and outside corners.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.

B. Perform the following operations immediately after completing resilient sheet flooring installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.
C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION 096516
SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Solid vinyl floor tile.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: For each type of floor tile.
   1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   2. Show details of special patterns.
C. Samples: Full-size units of each color and pattern of floor tile required.
D. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS
A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS
A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Floor Tile: Furnish one (1) box for every fifty (50) boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE

A. Basis of Design:

1. Armstrong World Industries, Inc; Pryzm

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Altro
2. Bentley Mills
3. Burker Flooring, a division of Burke Industries
4. Mannington Mills, Inc
5. Mohawk Group
7. To Market
8. Substitutions: Under provision of Section 012500 “Substitution Procedures”.

C. Tile Standard: ASTM F 1700.
   2. Type: B, embossed surface.
   3. Slip resistant with a Coefficient of Friction of not less than 0.7 on level surface (dry) in accordance with ASTM D 2047.

D. Thickness, Size, Colors and Patterns: LVT-1, as indicated in Section 090000 “Schedule of Finishes”.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
   1. Basis of Design: Armstrong World Industries, Inc; Summit Select

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 7 or more than 9.9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three (3) tests in each installation area and with test areas evenly spaced in installation areas.
   a. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum ninety percent (90%) relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate. Expect and include in the Base Bid the requirement to apply and machine level at least three (3) coats of leveler in all spaces.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
   1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
   1. Lay tiles in pattern of colors and sizes indicated.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover floor tile until Substantial Completion.

END OF SECTION 096519
SECTION 096536 - STATIC-CONTROL RESILIENT FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Static-dissipative, vinyl sheet floor covering.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of static-control resilient flooring. Include floor-covering layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.
2. Show locations of inscribed maintenance tiles.
3. Submit grounding diagram showing location of grounding strips and connections.

C. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6-by-9-inch sections.

1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

D. Seam Samples: For seamless-installation technique indicated and for each static-control resilient flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

E. Product Schedule: For static-control resilient flooring. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for static-control resilient flooring.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of static-control resilient flooring to include in maintenance manuals.
1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sheet Floor Covering: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each color, pattern, and type of sheet floor covering installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for static-control resilient flooring and seaming method.

1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store static-control resilient flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1. Sheet Floor Covering: Store rolls upright.

1.9 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive static-control resilient flooring during the following time periods:

1. Forty-eight (48) hours before installation.
2. During installation.
3. Forty-eight (48) hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during static-control resilient flooring installation.

D. Close spaces to traffic for forty-eight (48) hours after static-control resilient flooring installation.

E. Install static-control resilient flooring after other finishing operations, including painting, have been completed.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Static-Dissipative Properties: Provide static-control resilient flooring with static-control properties indicated as determined by testing identical products per test method indicated by an independent testing and inspecting agency.

1. Electrical Resistance: Test per ASTM F 150 with 100-V applied voltage.
   a. Average greater than 1 megohm and less than or equal to 1000 megohms when test specimens are tested surface to ground.
   b. Average greater than 1 megohm and less than or equal to 1000 megohms when installed floor coverings are tested surface to ground.

2. Static Generation: Less than 3300 V when tested per AATCC-134 at twenty percent (20%) relative humidity with conductive footwear.

3. Static Decay: 5000 to zero V in less than 0.25 seconds when tested per FED-STD-101C/4046.1.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 STATIC-DISSIPATIVE RESILIENT FLOOR COVERINGS

A. Static-Dissipative, Vinyl Sheet Floor Covering: ASTM F 1913 (unbacked) or ASTM F 1303, Type II, Grade I, Class B (non-foamed plastic backing).

1. Basis of Design:
   a. Johnsonite; a Tarkett company; Granit-SD

2. Products: Subject to compliance with requirement, available products that may be incorporated into the Work include, but are not limited to, the following;
   a. Altro USA
   b. Armstrong World Industries, Inc.
   c. Forbo Industries, Inc.
   d. Mannington Mills, Inc.
   e. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

3. Size: Manufacturer's standard roll width and length.
5. Slip resistant with a Coefficient of Friction of not less than 0.5 on level surface (dry) in accordance with ASTM D 2047.
6. Thickness, Sheet Width, Colors and Patterns: SD-1, as indicated in Section 090000 “Schedule of Finishes”.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified Portland cement or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
   1. Adhesives shall have a VOC content of 60 g/L or less.

C. Grounding Strips: Provided or approved by manufacturer; type and size that maintains electrical continuity of floor-covering system to ground connection.

D. Seamless-Installation Accessories:

E. Integral-Flash-Cove Base Accessories:
   1. Cove Strip: 1-inch radius support strip provided or approved by manufacturer.
   2. Cap Strip: Square metal, vinyl, or rubber cap provided or approved by manufacturer.
   3. Corners: Metal inside and outside corners and end stops provided or approved by floor-covering manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion or static-control characteristics of floor coverings.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of static-control resilient flooring and electrical continuity of floor-covering systems.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with floor-covering adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
   a. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum eighty-five percent (85%) relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate. Expect and include in the Base Bid the requirement to apply and machine level at least three (3) coats of leveler in all spaces.

D. Do not install static-control resilient flooring until it is same temperature as space where it is to be installed.
   1. Move static-control resilient flooring and installation materials into spaces where they will be installed at least forty-eight (48) hours in advance of installation.

E. Sweep and vacuum substrates to be covered by static-control resilient flooring immediately before installation.

3.3 INSTALLATION, GENERAL

A. Install static-control resilient flooring according to manufacturer's written instructions.

B. Embed grounding strips in static-control adhesive. Extend grounding strips beyond perimeter of static-control resilient floor-covering surfaces to ground connections.

C. Scribe, cut, and fit static-control resilient flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

D. Extend static-control resilient flooring into toe spaces, door reveals, closets, and similar openings. Extend static-control resilient flooring to center of door openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on static-control resilient flooring as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

F. Adhere static-control resilient flooring to substrates using a full spread of static-control adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

G. Seamless Installation:
   1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor-covering surfaces.
H. Integral-Flash-Cove Base: Cove static-control flooring 6 inches up vertical surfaces. Support static-control resilient flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

1. Install metal corners at inside and outside corners.

3.4 SHEET FLOOR-COVERING INSTALLATION

A. Comply with manufacturer's written instructions for installing sheet floor coverings.

B. Unroll sheet floor coverings and allow them to stabilize before cutting and fitting.

C. Lay out sheet floor coverings as follows:

1. Maintain uniformity of sheet floor-covering direction.
2. Minimize number of seams and place them in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor-covering substrates.
3. Match edges of floor coverings for color shading at seams.
4. Avoid cross seams.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of static-control resilient flooring.

B. Perform the following operations immediately after completing static-control resilient flooring:

1. Remove static-control adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect static-control resilient flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

1. Do not wax static-control resilient flooring.

D. Cover static-control resilient flooring until Substantial Completion.

END OF SECTION 096536
SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes modular carpet tile.

B. Related Requirements:
   1. Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
      a. Review delivery, storage, and handling procedures.
      b. Review ambient conditions and ventilation procedures.
      c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
   2. Include installation recommendations for each type of substrate.

B. Shop Drawings: For carpet tile installation, plans showing the following:
   1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   2. Carpet tile type, color, and dye lot.
   3. Type of subfloor.
   4. Type of installation.
   5. Pattern of installation.
   6. Pattern type, location, and direction.
   7. Pile direction.
   8. Type, color, and location of insets and borders.
   9. Type, color, and location of edge, transition, and other accessory strips.
   10. Transition details to other flooring materials.
C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

   2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

   1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
   2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   1. Carpet Tile: Full-size units equal to twenty percent (20%) of amount installed for each type indicated, but not less than 40 sq. yd.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI's "CRI Carpet Installation Standard."

1.10 FIELD CONDITIONS

A. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
1.11 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than ten percent (10%) edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Basis-of-Design Product:

   1. J+J Invision (CPT-1)
   2. Shaw Contract Group; Places Collection (CPT-2)

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   1. Patcraft
   2. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Material Characteristics: As indicated in Section 090000 “Schedule of Finishes”.

P. Performance Characteristics: As follows:

   1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
   2. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

   1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI's "Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8-inch-wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions. Expect and include in the Base Bid the requirement to apply and machine level at least three (3) coats of leveler in all spaces.

C. Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.

B. Installation Method: As recommended in writing by carpet tile manufacturer.

C. Maintain dye lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.
H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
   2. Remove yarns that protrude from carpet tile surface.

B. Protect installed carpet tile to comply with CRI's "Carpet Installation Standard," Section 20, "Protecting Indoor Installations."

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813
SECTION 097200 - WALL COVERINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Non-woven, vinyl wall covering.

1.3 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include data on physical characteristics, durability, fade resistance and fire-test-response
         characteristics.
   B. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern
      placement, seams and termination points.
   C. Samples: For each type of wall covering and for each color, pattern, texture and finish specified,
      full width by 36-inch-long in size.
      1. Wall-Covering Sample: From same production run to be used for the Work, with
         specified treatments applied. Show complete pattern repeat.
   D. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For testing agency.
   B. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For wall coverings to include in maintenance manuals.
1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Covering Materials: For each type, color, texture and finish, full width by length to equal to five percent (5%) of amount installed.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.

B. Lighting: Do not install wall covering until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 50 or less.

2.2 VINYL WALL COVERING

A. Basis-of-Design Product:

1. D.L. Couch

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. DesignTex Inc.; a Steelcase company
2. Level Digital Wallcoverings
3. MDC Wallcoverings
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
C. Description: Provide mildew-resistant products in rolls from same production run and complying with the following:

   1. FS CCC-W-408D and CFFA-W-101-D for Type II, Medium-Duty products.

D. Total Weight: 20 ounces per linear yard, excluding coatings.

E. Width: Per manufacturer.


G. Colors, Textures, and Patterns: WC, as indicated in Section 090000 “Schedule of Finishes”.

2.3 ACCESSORIES

A. Adhesive: Mildew-resistant, non-staining, strippable adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.

B. Primer/Sealer: Mildew resistant, complying with requirements in Section 099123 "Interior Painting" and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.

C. Seam Tape: As recommended in writing by wall-covering manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.

   1. Moisture Content: Maximum of five percent (5%) on new plaster, concrete and concrete masonry units when tested with an electronic moisture meter.

D. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
3.3 WALL-COVERING INSTALLATION

A. Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated.

B. Cut wall-covering strips in roll number sequence. Change the roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.

D. Install wall covering without lifted or curling edges and without visible shrinkage.

E. Trim edges and seams for color uniformity, pattern match and tight closure. Butt seams without overlaps or gaps between strips.

F. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

3.4 CLEANING

A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 097200
SLAT-WALL ASSEMBLIES

SECTION 097700 - SLAT-WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Slat-wall panel assemblies, pre-engineered and machined for use with retail display hardware.

1.3 ACTION SUBMITTALS

A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation instructions or methods.

B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.

C. Samples: For each exposed product and for each color and texture specified, prepared on samples of size indicated below complete with exposed molding and trim samples.

1. Laminate and Printed Finishes: 6-inch by 10-inch section of panel for each panel selected indicating the color, texture, and pattern required.

   a. Submit complete with specified applied finish.
   b. For selected patterns show complete pattern repeat.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturers Material Safety Data Sheets (MSDS) for panels, adhesives, or other products as appropriate, are available and can be provided by request prior to material delivery to the site.

B. Installation and/or maintenance instructions.

C. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of unit to include in maintenance manuals.
1.6 QUALITY ASSURANCE
   A. Conform to building code requirements for interior finish for smoke and flame spread
      requirements as tested in accordance with:

      1. ASTM E 84 (Method of test for surface burning characteristics of building Materials).
      2. Required Rating – Class C.

1.7 DELIVERY, STORAGE AND HANDLING
   A. Deliver panels and associated materials factory packaged on strong pallets and properly
      packaged or protected.

      1. Upon delivery carefully inspect all cartons, packages, pallets and protective wrap for
         damage or material shortage.
      2. Open and inspect suspect packages, cartons or wrapped pallets for damage.
      3. Contact shipper immediately to report any damaged or missing materials.

   B. Store products in manufacturer's unopened packaging until ready for installation.

      1. Maintain plastic or other protective wrap in place during on site handling until ready for
         installation.
      2. Keep panels clean and do not stack panels after removal of protection.

1.8 FIELD CONDITIONS
   A. Partition walls are to be finished and the building completely closed. Walls shall be thoroughly
      dry and concrete cured and dry before starting installation.

   B. HVAC system should be operable and installation area balanced to normal operating conditions.

   C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits
      recommended by manufacturer for optimum results. To ensure product performance, a
      temperature range of 60°-80°F (16°C-27°C) and a humidity range of thirty-five to fifty-five
      percent (35-55%) must be maintained during storage, installation and product life cycle. Do not
      install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION AND SEQUENCING
   A. Locate trim members so that panel lines coordinate with doors, headers, jambs and other
      discontinuities in a wall.

   B. Vapor barrier shall be used on exterior walls behind backing to discourage warping.

   C. Coordinate with casework manufacturer. Deliver material to the fabrication shop.

1.10 WARRANTY
   A. All products shall be warranted to be free from defects for a period of thirty (30) days after
      installation.
PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design:

1. Barr Display

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Marlite, a Verzatec company

C. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.2 MATERIALS

A. Panels:

1. Configuration: Engineered t-groove machined into wood composite substrate with metal inserts.
   a. Thickness: ¾-inch-thick with nominal ½-inch-deep slotted groove.
   b. Panel grooves machined on 6-inch centers.
   2. Material:
      a. Medium density wood fiberboard, conforming to ANSI A208.2, industrial-grade MDF or other wood fiber substrates having no added formaldehyde.
      b. Low-pressure laminate (melamine treated paper) bonded to wood fiber substrate by hot melt adhesive.
      c. Square cut and sealed edges.
      d. Finish: SW-1, as indicated in Section 090000 “Schedule of Finishes”.
      e. Inserts: Mill finish aluminum, factory-installed.

B. Shelves: To match panels, in lengths indicated in Section 090000 “Schedule of Finishes”.

C. Edge Caps: To match panels.

2.3 ACCESSORIES

A. Phillips, bugle head, coarse threaded screws.

B. Adhesive as recommended by manufacturer, low VOC.

C. Shelf Brackets: Size to match shelf, black finish, minimum two (2) brackets per shelf.

2.4 FABRICATION

A. All panels, hardware and accessories shall be factory finished and ready to install. Field fabrication will be required at perimeter conditions.
B. Panel edges must be refinished per manufacturer’s instruction after field cutting, before installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions under which construction activities of this section are to be performed. Submit written notification to Architect and system manufacturer if such conditions are unacceptable. Beginning erection constitutes installer’s acceptance of conditions.

1. Verify that a vapor barrier has been provided on exterior walls behind backing to prevent warping.
2. Verify backing panels are smooth, solid, and flat.
3. Verify that walls are primed or sealed before installation begins.
4. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.
5. Verify that stud spacing does not exceed 24 inches on-center.
6. Verify that HVAC systems are operational and building environment is balanced to end use conditions.

B. Structural walls are to be finished, with building completely closed. Walls shall be thoroughly dry before starting installation.

3.2 PREPARATION

A. Conditioning: Allow panels to acclimate to a balanced environment in the installation location for 72 hours prior to installation.

B. Protect existing surfaces with drop cloths.

3.3 INSTALLATION

A. Comply with manufacturer's recommended procedures and installation sequence.

1. Assure installed hardware to be straight, plumb and level.
2. Anchor units rigidly and securely in place.
3. Cut sheets to meet existing supports.

B. Fasten initial bottom panel to the wall with #6 or #7 bugle head drywall screws. Install a minimum of one (1) screw every slot (or 6 inches) vertically and every stud horizontally, typically every 16 inches on centers horizontally (maximum 24 inches on centers horizontally).

1. Where screws do not hit the studs, fasten with adhesive in accordance with the manufacturer’s recommendations.
2. Screws must be installed thru the panel grooves.
3. Panels with inserts require 5/32-inch pre-drilling of holes thru the insert and panel before fastening.

C. Avoid contamination of the panel faces with adhesives, solvents or cleaners during installation.
3.4 CLEANING

A. Clean and remove dust and other foreign matter from panel and framing surfaces. Clean finishes in accordance with manufacturer's instructions.

END OF SECTION 097700
SECTION 098433 - SOUND-ABSORBING WALL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes shop-fabricated panel units tested for acoustical performance, including:
      1. Sound-absorbing wall panels.

1.3 DEFINITIONS
   A. NRC: Noise Reduction Coefficient.

1.4 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS
   A. Product Data: For each type of panel edge, core material, and mounting indicated.
   B. Shop Drawings: For sound-absorbing units. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge and core materials.
      1. Include elevations showing panel sizes.

1.6 INFORMATIONAL SUBMITTALS
   A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
      1. Electrical outlets, switches, and thermostats.
      2. Items penetrating or covered by sound-absorbing units including the following:
         a. Lighting fixtures.
         b. Air outlets and inlets.
         c. Speakers.
         d. Alarms.
         e. Sprinklers.
         f. Access panels.
3. Show operation of hinged and sliding components covered by or adjacent to sound-absorbing wall units.

B. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sound-absorbing units to include in maintenance manuals. Include manufacturers' written cleaning and stain-removal recommendations.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sound-Absorbing Wall Units: Full-size units equal to five percent (5%) of amount installed, but no fewer than five (5) units.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with sound-absorbing unit manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install sound-absorbing units until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install sound-absorbing units until a permanent level of lighting is provided on surfaces to receive the units.

C. Air-Quality Limitations: Protect sound-absorbing units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.

D. Field Measurements: Verify locations of sound-absorbing wall units and actual dimensions of openings and penetrations by field measurements before fabrication.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of sound-absorbing units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to the following:

   b. Sagging and warping.
2. Warranty Period: Manufacturer’s standard, but minimum of one (1) year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design:

1. Armstrong World Industries, Inc.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Acoustical Panel Systems (APS, Inc.).
2. Acoustical Solutions, Inc.
3. Decoustics Limited; a CertainTeed Ceilings company.
4. Sound Management Group LLC.
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.

2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.3 SOUND-ABSORBING WALL UNITS

A. Sound-Absorbing Wall Panel (AWP): Manufacturer's standard panel construction consisting of facing material stretched over front face of edge-framed core and bonded or attached to edges and back of frame.

1. Basis-of-Design Product:
   a. Armstrong World Industries; Soundsoak 85 Custom

2. Mounting: Back mounted with manufacturer's standard metal clips or bar hangers, secured to substrate.
3. Core: Glass-fiber board.
4. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
5. Edge Profile: Square.
6. Corner Detail in Elevation: Square with continuous edge profile indicated.
7. Acoustical Performance: Sound absorption NRC of not less than 0.80 according to ASTM C 423 for Type A mounting according to ASTM E 795.
8. Facing Material, Panel Thickness, Width, Height and Color: As indicated in Section 090000 “Schedule of Finishes”.

2.4 MATERIALS

A. Core Materials:

1. Glass-Fiber Board: ASTM C 612; of type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft., unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

B. Mounting Devices:

1. Metal Clips or Bar Hangers: Manufacturer's standard two-part metal "Z" clips, with one part of each clip mechanically attached to back of unit and the other part to substrate, designed to permit unit removal.

2.5 FABRICATION

A. Standard Construction: Use manufacturer's standard construction unless otherwise indicated; with facing material applied to all faces of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.

B. Edge Hardening: For glass-fiber board cores, chemically harden core edges and areas of core where mounting devices are attached.

C. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.

1. Square Corners: Tailor corners.
2. Radius and Other Non-Square Corners: Attach facing material so there are no seams or gathering of material.

D. Dimensional Tolerances of Finished Units: Plus or minus 1/16-inch for the following:

1. Thickness.
2. Edge straightness.
3. Overall length and width.
4. Squareness from corner to corner.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fabricated units, substrates, areas, and conditions, for compliance with requirements, installation tolerances, and other conditions affecting unit performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

B. Comply with manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.

C. Align and level fabric pattern and grain among adjacent units.

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb and Level: Plus or minus 1/16-inch.

B. Variation of Panel Joints from Hairline: Not more than 1/16-inch-wide.

3.4 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 098433
SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Steel and iron.
4. Wood.
5. Gypsum board.

B. Related Requirements:

1. Section 099600 "High-Performance Coatings" for high-performance and special-use coatings.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Samples: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Apply coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.
C. Product List: Cross-reference to paint system and locations of application areas. Use same
designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are
packaged with protective covering for storage and identified with labels describing contents.

   1. Paint: Five percent (5%), but not less than 1 gal. of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient
temperatures continuously maintained at not less than 45 deg F (7 deg C).

   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are
between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds eighty-five percent (85%); at temperatures
less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design:

   1. Benjamin Moore & Co.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering
products that may be incorporated into the Work include, but are not limited to, the following:

   1. ICI Paints
   2. Sherwin-Williams Company (The)
   3. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed
in its "MPI Approved Products List."

B. Material Compatibility:

   1. Provide materials for use within each paint system that are compatible with one another
and substrates indicated, under conditions of service and application as demonstrated by
manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Non-Flat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

D. Colors: As selected by Architect and Owner from manufacturer’s full range if not specified as PT- in Section 090000 “Schedule of Finishes”.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two (2) paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: Twelve percent (12%).
2. Wood: Fifteen percent (15%).
3. Gypsum Board: Twelve percent (12%).

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
   1. SSPC-SP 2, "Hand Tool Cleaning."
   2. SSPC-SP 3, "Power Tool Cleaning."

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

H. Wood Substrates:
   1. Sand surfaces that will be exposed to view and dust off.
   2. Prime edges, ends, faces, undersides, and backsides of wood.
3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms, unless factory-finished:
   a. Equipment, including panelboards.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
   g. Tanks that do not have factory-applied final finishes.
   h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

2. Paint the following work where exposed in occupied spaces, unless factory-finished:
   a. Equipment, including panelboards.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

h. Other items as directed by Architect.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates:

1. Water-Based Clear Sealer System:
   a. First Coat: Sealer, water based, MPI #99.
   b. Topcoat: Sealer, water based, MPI #99.

B. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System:
   c. Topcoat: Latex, interior, institutional low odor/VOC, eggshell (Gloss Level 3), MPI #145.

C. Galvanized-Metal Substrates:
1. Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer, galvanized, water based, MPI #134.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat (Gloss Level 1), MPI #143, at exposed ductwork.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #148.

D. Wood Substrates: Architectural trim.
   1. Latex over Latex Primer System:
      a. Prime Coat: Primer, latex, for interior wood, MPI #39.
      b. Topcoat: Latex, interior, semi-gloss (Gloss Level 5), MPI #54.

E. Gypsum Board Substrates:
   1. Latex System:
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53, at ceilings.
      d. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.

END OF SECTION 099123
SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes surface preparation and application of wood finishes.

1.3 DEFINITIONS
   A. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product. Include preparation requirements and application instructions.
      1. Include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the product proposed for use highlighted.
      2. Indicate VOC content.
   B. Samples: For each type of finish system and in each color and gloss of finish indicated.
      1. Submit Samples on representative samples of actual wood substrates, 8 inches long.
      2. Label each Sample for location and application area.
   C. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.5 MAINTENANCE MATERIAL SUBMITTALS
   A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Stains and Transparent Finishes: Five percent (5%), but not less than 1 gallon of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
      1. Maintain containers in clean condition, free of foreign materials and residue.
      2. Remove rags and waste from storage areas daily.
1.7 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply finishes when relative humidity exceeds eighty-five percent (85%); at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.
2. Cabot
3. Pratt & Lambert
4. Sherwin-Williams Company (The)
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.2 MATERIALS, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior stains and finishes applied at project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
2. Shellacs, Clear: VOC not more than 730 g/L.
3. Stains: VOC not more than 250 g/L.

D. Colors: To match PL-1, as indicated in Section 090000 “Schedule of Finishes”.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Interior Wood Substrates: Fifteen percent (15%), when measured with an electronic moisture meter.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with finish application only after unsatisfactory conditions have been corrected.
   1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
   1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.

D. Interior Wood Substrates:
   1. Refer to AWI recommendations.
   2. Scrape and clean knots and apply coat of knot sealer.
   3. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
   4. Sand surfaces that will be exposed to view and dust off.

3.3 APPLICATION

A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
   1. Use applicators and techniques suited for finish and substrate indicated.
2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

A. Wood substrates, non-traffic surfaces.

1. Polyurethane Varnish over Stain System:
   a. Stain Coat: Stain, semi-transparent, for interior wood, MPI #90.
   c. Topcoat: Varnish, polyurethane, oil-modified, satin (Gloss Level 4), MPI #128 as a minimum.

END OF SECTION 099300
SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and application of high-performance coating systems on the following substrates:

1. Interior Substrates:
   a. Gypsum board.

B. Related Requirements:

1. Section 099123 "Interior Painting" for general field painting.

1.3 DEFINITIONS

A. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Samples: For each type of coating system and in each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Apply coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

C. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Coatings: Five percent (5%), but not less than 1 gal. of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply coatings when relative humidity exceeds eighty-five percent (85%); at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:

1. Benjamin Moore & Co.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ICI Paints
2. Sherwin-Williams Company (The)
3. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and are listed in "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
3. Provide products of same manufacturer for each coat in a coating system.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base:
1. Flat Paints and Coatings: 50 g/L.
2. Non-Flat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: 250 g/L.
6. Pretreatment Wash Primers: 420 g/L.
7. Floor Coatings: 100 g/L.
8. Shellacs, Clear: 730 g/L.
9. Shellacs, Pigmented: 550 g/L.

D. Colors: EP-1, as indicated in Section 090000 “Schedule of Finishes”.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two (2) paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Gypsum Board: Twelve percent (12%).

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.
3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for coating and substrate indicated.

2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.

3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

1. Contractor shall touch up and restore coated surfaces damaged by testing.

2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and
apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Gypsum Board/Plaster Substrates:

   1. High Performance Institutional Low-Odor/VOC Epoxy System:
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      c. Topcoat: Epoxy, interior, eggshell (Gloss Level 3), MPI #254.
SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Panel signs.

B. Related Sections include the following:
   1. Section 015000 "Temporary Facilities and Controls" for temporary information and directional signs.
   2. Section 220553 "Identification for Plumbing Piping and Equipment" for labels, tags, and nameplates for plumbing systems and equipment.
   3. Section 230553 "Identification for HVAC Piping and Equipment" for labels, tags, and nameplates for HVAC systems and equipment.
   4. Section 260553 "Identification for Electrical Systems" for labels, tags, and nameplates for electrical equipment.
   5. Section 265213 "Emergency and Exit Lighting" for illuminated Exit signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for signs.
   1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

C. Samples: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
   1. Acrylic Sheet: Full-size Sample for each color required.

D. Sign Schedule: Use same designations indicated on Drawings or as listed in special schedule.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Warranty: Special warranty specified in this Section.
1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Source Limitations for Signs: Obtain each sign type indicated from one (1) source from a single manufacturer.


1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failure include, but are not limited to, the following:
   a. Deterioration of metal finishes beyond normal weathering.
   b. Deterioration of embedded graphic image colors and sign lamination.

2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS


B. Sign finish shall comply with the following performance requirements:

1. Durability: Sign finish shall show no effect after repeated use of cleaners.

2.2 MATERIALS

A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.3 PANEL SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Best Sign Systems, Inc.
B. Interior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16-inch measured diagonally from corner to corner.

C. Interior Signs: Provide matte finish plaques in sizes to accommodate the message indicated in the Signage Schedule on the Door Schedule. Fabricate of acrylic plastic conforming to ASTM D 709, Type NDP minimum 3/16-inch for non-slotted and 1/8-inch for slotted signs. Provide with rounded corners.

1. Graphics Application:
   a. Raised Letters: Chemically weld 1/16-inch-thick acrylic message letters to front surface of plaque prior to application of background color to rear of sheet. These shall comply with Section 703.2.3 (not italic, oblique, script or decorative) and 703.2.4 (1-inch character height) of the ICC/ANSI A117.1 Code.
   b. Pictogram: Each sign shall be provided with an international symbol of accessibility per Section 4.30.7 (Figure 43 a and b) of the Americans with Disabilities Act. The raised image pictogram shall be placed within the limits of the sign panel insert and to the right of the text.
   c. Messages:
      1) Typeface: Helvetica Medium, with accompanying Grade 2 Braille message.
      2) Type Size: 1-inch large and small case, with width, height and stroke complying with the requirements of Section 703.2.5 (maximum stroke width fifteen percent (15%) of the height of each letter at the top surface of the character and thirty percent (30%) maximum of the height of each letter at the base; character spacing 1/8-inch minimum and four (4) times the tactile character stroke width maximum and spacing between lines shall be between one hundred thirty-five percent (135%) and one hundred seventy percent (170%) of the tactile character height) of the ICC/ANSI A117.1 Code.
      3) Background Color: In color selected by Architect and Owner from manufacturer's full range, except for accessibility pictogram background, which will be blue. Message Color: White.

2.4 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.

1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
2. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
2.5 FINISHES, GENERAL

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five (5) years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.

2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.

B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.

1. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.

3.3 CLEANING AND PROTECTION

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.
C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101400
SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Cast dimensional characters.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings: For signs.
      1. Include fabrication and installation details and attachments to other work.
      2. Show sign mounting heights, locations of supplementary supports to be provided by other
         installers, and accessories.
      3. Show message list, typestyles, graphic elements, and layout for each sign at least half
         size.
   C. Samples: For each type of sign assembly showing all components and with the required
      finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
      1. Dimensional Characters: Full-size Sample of each type of dimensional character.
   D. Product Schedule: For dimensional letter signs. Use same designations indicated on Drawings
      or specified.

1.4 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For manufacturer.
   B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE
   A. Installer Qualifications: Manufacturer of products.
1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Deterioration of finishes beyond normal weathering.
   b. Separation or delamination of sheet materials and components.

2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

A. Cast Characters: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:

1. Basis-of-Design Product:
   a. Gemini Incorporated

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ASI Sign Systems, Inc.
   b. Seton Identification Products
   c. Substitution Procedures: Under provisions of Section 012500 “Substitution Procedures”.

5. Thickness: Manufacturer's standard for size of character.
6. Finishes:
   a. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color as selected by Architect and Owner from manufacturer's entire range.

7. Mounting: Concealed studs.
8. Typeface: Helvetica.
9. Text: As indicated on Drawings.

2.2 DIMENSIONAL CHARACTER MATERIALS

A. Aluminum Castings: ASTM B 26, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
2.3 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. Sign Mounting Fasteners:

      a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

   1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
   2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
   4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   5. Internally brace dimensional characters for stability and for securing fasteners.
   6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
   7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.
2.6 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer’s written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer’s written instructions.

   1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
   3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:

   1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

      a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
      b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.
C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101419
SECTION 102113.17 - PHENOLIC-CORE TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Phenolic-core toilet compartments configured as toilet enclosures and urinal screens.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for blocking and overhead support of floor-and-ceiling-anchored compartments.
   2. Section 102800 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories mounted on toilet compartments.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.

B. Shop Drawings: For toilet compartments.
   1. Include plans, elevations, sections, details, and attachment details.
   2. Show locations of cutouts for compartment-mounted toilet accessories.
   3. Show locations of centerlines of toilet fixtures.
   4. Show locations of floor drains.
   5. Show overhead support or bracing locations.

C. Samples for Initial Selection: For each type of toilet compartment material indicated.
   1. Include Samples of hardware and accessories involving material and color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of toilet compartment.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet compartments to include in maintenance manuals.
PHENOLIC-CORE TOILET COMPARTMENTS

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Door Hinges: One (1) hinge with associated fasteners.
2. Latch and Keeper: One (1) latch and keeper with associated fasteners.
3. Door Bumper: One (1) door bumper with associated fasteners.
4. Door Pull: One (1) door pull with associated fasteners.
5. Fasteners: Ten (10) fasteners of each size and type.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.2 PHENOLIC-CORE TOILET COMPARTMENTS

A. Basis of Design:

1. Bobrick Washroom Equipment, Inc.; 1182 Duraline Series

B. Manufacturers:

1. Bradley Corporation
2. General Partitions Mfg. Corp.
3. Tex-Lam Manufacturing, Inc.
4. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Toilet-Enclosure Style: Overhead braced.

D. Urinal-Screen Style: Floor anchored.

E. Door, Panel, Screen and Pilaster Construction: Solid phenolic-core panel material with melamine facing on both sides fused to substrate during panel manufacture (not separately
laminated), and with eased and polished edges. Provide minimum ¾-inch-thick doors and pilasters and minimum ½-inch-thick panels.

F. Pilaster Shoes and Sleeves (Caps): Formed from stainless-steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.

G. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.

H. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless-steel.

I. Phenolic-Panel Finish:

1. Facing Sheet Finish: One (1) color and pattern in each room.
2. Color and Pattern: As selected by Architect and Owner from manufacture’s entire range.
3. Edge Color: Manufacturer's standard.

2.3 HARDWARE AND ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard operating hardware and accessories.

2. Hinges: Manufacturer's standard paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door.
3. Latch and Keeper: Manufacturer's standard surface-mounted self-latching unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with anti-grip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless-steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS


B. Aluminum Extrusions: ASTM B 221.
C. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

D. Stainless-Steel Castings: ASTM A 743.

2.5 FABRICATION

A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.

D. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide in-swinging doors for standard toilet compartments and 36-inch-wide out-swinging doors with a minimum 32-inch-wide clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

1. Confirm location and adequacy of blocking and supports required for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:


2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.

   a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
   b. Align brackets at pilasters with brackets at walls.
B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1¾ inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two (2) fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched, unless the compartment is designated as accessible, where the doors are to return to fully closed position. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113.17
SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Impact-resistant wall coverings.
   B. Related Requirements:
      1. Section 087100 "Door Hardware" for metal armor, kick, mop, and push plates.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
      2. Include fire ratings of units recessed in fire-rated walls and listings for door-protection items attached to fire-rated doors.
   B. Shop Drawings: For each wall and door protection showing locations and extent.
      1. Include plans, elevations, sections, and attachment details.
   C. Samples: For each type of exposed finish on the following products, prepared on Samples of size indicated below:
      1. Impact-Resistant Wall Covering: 6 by 6 inches square.

1.4 INFORMATIONAL SUBMITTALS
   A. Material Certificates: For each plastic material, from manufacturer.
   B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.
1. Include recommended methods and frequency of maintenance for maintaining best condition under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 deg F (21 deg C) during the period plastic materials are stored.
2. Keep plastic materials out of direct sunlight.
3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).

1.8 WARRANTY

A. Special Warranty: Manufactures agrees to repair or replace components of wall and door protection units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
   b. Deterioration of materials beyond normal use.

2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wall- and door-protection products of each type from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.
2.3 IMPACT-RESISTANT WALL COVERINGS

A. Impact-Resistant Sheet Wall Covering: Fabricated from plastic sheet wall-covering material.

1. Basis of Design:
   a. Altro USA; Puraguard

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. IPC Door and Wall Protection Systems; Division of InPro Corporation
   b. Korogard Wall Protection Systems; a division of RJF International Corporation
   c. Pawling Corporation
   d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

3. Sheet Thickness: Minimum 0.08-inch.
4. Height: Full wall.
5. Trim and Joint Moldings: Extruded rigid plastic that matches sheet wall covering color.
7. Size, Color and Texture: WPP-1, as indicated in Section 090000 “Schedule of Finishes”.

2.4 MATERIALS

A. PVC Plastic: ASTM D 1784, Class I, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout; extruded and sheet material, thickness as indicated.

1. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
2. Chemical and Stain Resistance: Tested according to ASTM D 543 or ASTM D 1308.
3. Self-extinguishing when tested according to ASTM D 635.
4. Flame-Spread Index: 25 or less.
5. Smoke-Developed Index: 450 or less.

B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

C. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of work.

B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing wall and door protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer’s written instruction, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

C. Impact-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.4 CLEANING

A. Immediately after completion of installation, clean using a standard, ammonia-based, household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600
SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Public-use washroom accessories.
   2. Public-use shower room accessories.
   3. Private-use bathroom accessories.
   4. Warm-air dryers.

B. Related Sections:
   1. Section 061000 “Rough Carpentry” for blocking coordination.
   2. Section 088300 "Mirrors" for frameless mirrors.

1.3 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Include electrical characteristics.

B. Samples: Full size, for each exposed product and for each finish specified.
   1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
   1. Identify locations using room designations indicated.
1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer’s special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

A. Manufacturer’s Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: Fifteen (15) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
4. Bradley Corporation
5. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Source Limitations: Obtain accessories from single source from single manufacturer.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

A. Toilet Tissue (Roll) Dispenser:

1. Basis-of-Design Product: Bobrick #B-4288
2. Description: Double roll dispenser.
5. Capacity: Designed for 5¼-inch-diameter tissue rolls.
7. Lockset: Tumbler type.

B. Liquid-Soap Dispenser:

1. Basis-of-Design Product: Bobrick #B-4112
2. Description: Designed for dispensing soap in liquid or lotion form.
5. Materials: Stainless-steel, No. 4 finish (satin) container and black molded plastic push button and spout.
6. Lockset: Special key provided.
7. Refill Indicator: Window type.

C. Grab Bar:
1. Basis-of-Design Product: Bobrick #B-6806.99x18, x24, x36 and x42
3. Material: Stainless-steel, 0.05-inch-thick.
   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
5. Configuration and Length: As indicated in the Drawings.

D. Sanitary-Napkin Disposal Unit:
1. Basis-of-Design Product: Bobrick #B-270
3. Door or Cover: Self-closing, disposal-opening cover.
6. Locations: Female gang restrooms only.

E. Mirror Unit:
1. Basis-of-Design Product: Bobrick #B-290-1836
2. Frame: Stainless-steel angle, 0.05-inch-thick.
   a. Corners: Manufacturer's standard.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using one (1) of the methods indicated below.
   a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
   b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
4. Size: 18x36.

2.4 PUBLIC-USE SHOWER ROOM ACCESSORIES

A. Shower Curtain Rod:
1. Basis-of-Design Product: Bobrick #B-207x72
2. Description: 1-inch OD; fabricated from nominal 0.0375-inch-thick stainless-steel.
3. Mounting Flanges: Chrome-plated plastic flanges, mounted on concealed wall brackets.
4. Finish: No. 4 (satin).

B. Shower Curtain:
   1. Basis-of-Design Product: **Bobrick #B-204-2 and -1**
   2. Size: Minimum 12 inches wider than opening by 72 inches high.
   3. Material: Nylon-reinforced vinyl, minimum 10 oz. or 0.008-inch-thick vinyl, with integral antibacterial agent.
   5. Grommets: Corrosion resistant at minimum 6 inches o.c. through top hem.
   6. Shower Curtain Hooks: Chrome-plated or stainless-steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one (1) hook per curtain grommet.

C. Folding Shower Seat:
   1. Basis-of-Design Product: **Bobrick #5191**
   2. Configuration: Rectangular seat.
   3. Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect.

2.5 PRIVATE-USE BATHROOM ACCESSORIES

A. Robe Hook:
   1. Basis-of-Design Product: **Bobrick #B-6827**
   2. Description: Double-prong unit.
   4. Location: On back of single use restroom doors.

2.6 WARM-AIR DRYERS

A. Warm-Air Dryer:
   1. Basis-of-Design Product: **Bobrick B-7128**
   2. Mounting: Surface mounted, with low-profile design.
      a. Operation Time: Maximum 60 seconds.
   4. Cover Material and Finish: Polycarbonate casing with anti-microbial additive in paint or stainless steel; sprayed nickel finish or stainless steel, No. 4 finish (satin).

2.7 MATERIALS

A. Stainless-Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

C. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

D. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal ¼-inch-thick.


2.8 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six (6) keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800