

Bid Set



Roofing Repairs / Replacement Union Station Transportation Center

One Union Place
Hartford, CT

5 August 2020

SGH Project 191971.01
GHTD Project #02-021

SIMPSON GUMPERTZ & HEGER



Engineering of Structures
and Building Enclosures

PREPARED FOR:

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Greater Hartford Transit District
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5 August 2020

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BIDDING REQUIREMENTS

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**NOTICE
GREATER HARTFORD TRANSIT DISTRICT
INVITATION FOR BIDS
ROOFING REPAIRS/REPLACEMENT
UNION STATION TRANSPORTATION CENTER
GHTD IFB #02-021**

The Greater Hartford Transit District (GHTD), Hartford, Connecticut, a municipal corporation formed under Chapter 103a of the Connecticut General Statutes, Revision of 1958, as amended, is seeking a general contractor to perform roofing repairs of clay tile shingle roofing and replacement of membrane roofing, copper roofing, and asphalt shingle roofing (various roofs) within the area of work as indicated in the Bid Documents at the Union Station Transportation Center complex, located at One Union Place, Hartford, CT 06103.

Bid documents including drawings and specifications will be available on or after **Friday, August 7, 2020**. Printed versions of contract drawings and specifications may be purchased at a fee per set from the Reprostore, located at 37 Airport Road, Hartford, CT 06114. Reprostore customer service can be reached by telephone at (860) 296-0374 or via email at plots@reprostore.com. Purchases are non-refundable. Bidders can also access bid documents (including drawings and specifications) electronically for a fee through the Reprostore digital plan room on the website by visiting the following link: <https://www.reprostoreplanroom.com/>

In addition to the Reprostore, Bid documents (including drawings and specifications) will also be available at no cost on the District's website at www.hartfordtransit.org and on the State of Connecticut DAS Contracting Portal at https://biznet.ct.gov/SCP_Search/BidResults.aspx?groupid=127.

Bids shall be submitted to LaShaunda Drake, Greater Hartford Transit District, One Union Place, First Floor North, Hartford, CT. 06103, on or before **2:00 p.m. local time on Thursday, September, 10, 2020**. There will be a public bid opening at 2:10 p.m. local time held via GoToMeeting. **A Pre-Bid Conference will be held by the District on Friday, August 14, 2020 at 9:30 a.m. local time**, to provide an opportunity to outline the requirements the District will expect of the Bidder, as well as to provide the opportunity for questions and explanations. Such Conference will be held via GoToMeeting. Attendance at the Pre-Bid Conference is not mandatory, and is not a condition for final award.

Questions concerning the bidding process should be submitted in writing to LaShaunda Drake at ldrake@ghtd.org.

Bids received after the deadline will not be considered and will be returned to the bidder unopened. Any changes, or any requests for changes in the specifications, will not be recognized after sealed bids are submitted to the District.

Any contract resulting from this invitation for bids is subject to a financial assistance contract between the District and the Federal Transit Administration and the District and the State of Connecticut. All bidders will be required to certify that they are not on the Comptroller General's list of ineligible contractors. Further, the contractor will be required to comply with all applicable equal employment opportunity laws and regulations.

The GHTD hereby notifies all bidders that in regard to any contract entered into pursuant to this Invitation for Bids, advertisement or solicitation, disadvantaged business enterprises will be afforded full opportunity to submit proposals in response, and will not be subjected to discrimination on the basis of race, color, sex or national origin in consideration for an award.

The GHTD reserves the right to reject any and all bids as submitted by this Invitation for Bids, and to waive informalities and irregularities, as it deems in its best interest.



**INVITATION FOR BIDS
GHTD IFB #02-021**

**ROOFING REPAIRS/REPLACEMENT
UNION STATION TRANSPORTATION CENTER
HARTFORD, CT**

**GREATER HARTFORD TRANSIT DISTRICT
ONE UNION PLACE, HARTFORD, CT 06103
(860) 247-5329**

AUGUST 7, 2020

GHTD IFB #02-021 Roofing Repairs/Replacement
Union Station Transportation Center

IFB KEY INFORMATION SUMMARY SHEET

Invitation for Bids: Roofing Repairs/Replacement Union Station Transportation Center

Solicitation Number: IFB #02-021

IFB Issue Date: August 7, 2020

IFB Issuing Office: Greater Hartford Transit District

Procurement Officer: LaShaunda Drake
Procurement and Contract Coordinator
Greater Hartford Transit District
One Union Place
Hartford, CT 06103
Direct Phone: (860) 380-2012
Email: ldrake@ghtd.org

Proposal to be sent to: Greater Hartford Transit District
One Union Place
Hartford, CT 06103
Attn: LaShaunda Drake

Pre-Bid Conference: August 14, 2020 at 9:30 a.m. Local Time
Participation is NOT mandatory
Web Meeting via GoToMeeting
<https://global.gotomeeting.com/join/440562989>
Dial in by phone: (872) 240-3412
Access Code: 440-562-989

Inquiries Deadline: August 24, 2020 at 12:00 p.m. Local Time

Bid Due Date and Time: September 10, 2020 at 2:00 p.m. Local Time
Bid opening to start promptly at 2:10 p.m. Local Time
Web Meeting via GoToMeeting
<https://global.gotomeeting.com/join/687729389>
Dial in by phone: (408) 650-3123
Access Code: 687-729-389

GHTD IFB #02-021 Roofing Repairs/Replacement
Union Station Transportation Center

SECTION I – GENERAL INFORMATION FOR BIDDERS

1. INTRODUCTION

The Greater Hartford Transit District (the "District") is a quasi-municipal corporation operating under the authority of Chapter 103a of the Connecticut General Statutes. The District, a demand-response transit provider, is responsible for the provision of Americans with Disabilities (ADA) compliant door to door transportation services for disabled residents within the service area of CT Transit's Hartford and, New Britain/Bristol Divisions.

The District has broad powers to acquire, operate, finance, plan, develop, maintain and otherwise provide all forms of land transportation and related services including the development or renewal of transportation centers and parking facilities.

The District is also the owner and operator of Hartford's Historic Union Station Transportation Center Complex, an intermodal hub of transportation that currently serves Amtrak rail, CTrail, intercity and intra city bus service, taxi services, and public parking. The Complex includes the Spruce Street Parking Lot. The Union Station Transportation Center is a mixed-use facility that includes: ticketing booths for bus and rail travel, office space on three levels, and food/beverage vendors.

The District, as the owner and operator of the Union Station Transportation Center (the "Center") issues this formal Invitation for Bids (IFB) from qualified firms for a general contractor to perform roofing repairs of clay tile shingle roofing and replacement of membrane roofing, copper roofing, and asphalt shingle roofing (various roofs) within the area of work as indicated in the Bid Documents at the Union Station Transportation Center complex, located at One Union Place, Hartford, CT 06103. Simpson, Gumpertz & Heger (SGH) is the designer/engineer of record for this project.

The specifics of the services, and other documents relevant to this IFB, are set forth in the Scope of Services and in the Exhibits attached hereto and made a part hereof.

2. SUBMISSION OF BIDS

In order to respond, the Candidate must supply the required information on and along with the response forms. An officer or explicit agent of your organization must sign the response form and any supplementary proposal document.

a) Date and Location for Submittal

Bids must be submitted to the District on or before **Thursday, September, 10, 2020 at 2:00 p.m. local time**. There will be a public bid opening at 2:10 p.m. local time held via GoToMeeting.

To join the GoToMeeting, visit: <https://global.gotomeeting.com/join/687729389>
You can also dial in using your phone: (408) 650-3123
Access Code: 687-729-389

Each bid shall be securely sealed in a suitable envelope and marked "GHTD IFB #02-021 ROOFING REPAIRS/REPLACEMENT UNION STATION TRANSPORTATION CENTER" in capital letters on the envelope. Bids should be delivered to:

LaShaunda Drake
Procurement and Contract Coordinator
Greater Hartford Transit District
One Union Place
Hartford, Connecticut 06103-1409
(860) 380-2012

Late submissions will not be accepted. It is the responsibility of a Bidder to ensure that its Bid is delivered to the District by the date and time referred to hereinabove. Delivery by facsimile or other electronic means will not be accepted. Bids received before the opening date will be kept unopened until the time fixed for the bid opening. The person whose duty it is to open the bids will determine when the time stated for opening has arrived. All bids will be opened in public at the bid opening. Any person present shall have the right to have any part of the bids read aloud. The District reserves the right to postpone the bid opening if it is determined that to do so is in the best interest of the District.

b) Form of Bid

One copy of the bid form shall be completed, signed and submitted. No other form of bid or proposal will be acceptable.

Every designated space on the bid form shall be filled in or otherwise marked to show the bidder's intention clearly. Interlineations, alterations, erasures or any other change must be clearly initialed by the bidder. All amounts shall be stated in figures. The bid form is to be submitted along with the Certifications and other documents required by this IFB. Any conditional or qualified bid will be rejected.

3. BID INQUIRIES

Communication by any bidder with any agent or employee of the District on the subject of this IFB, or the pending process may result in the bidder being deemed ineligible with regard to this IFB. All questions and requests for clarification regarding this IFB or this process must be submitted in writing to LaShaunda Drake at ldrake@ghtd.org on or before **12:00 p.m. local time on Monday, August 24, 2020**. Responses shall be in writing and posted in the form of an addendum and will be distributed to all known recipients of the IFB document.

The bids submitted for the work must be based upon the text of this document including the General Information, Special Instructions, Specifications, all Addenda, and any referenced plans, and no oral or informal statement or representation by any representative or employee of the District or the designer shall be considered an amendment to or waiver of any statements in or requirement of such bidding or proposed contract documents and no claim or right of action shall accrue in favor of any respondent as a result of or founded on such oral or informal statements or representations. The District or its agents shall not be responsible for any oral instructions or interpretations given to a Bidder.

4. PRE-BID CONFERENCE

A Pre-Bid Conference will be held by the District via **GoToMeeting on Friday, August, 14, 2020 at 9:30 a.m. local time**, for the purpose of outlining the requirements and service standards that the District will expect of the Contractor, as well as to provide the opportunity for questions and explanations. The Bidder may submit any written requests for clarification as well as any questions regarding this solicitation package prior to the pre-bid conference. Attendance at the Pre-Bid Conference is not mandatory, and is not a condition for final award.

To join the GoToMeeting, visit: <https://global.gotomeeting.com/join/440562989>
You can also dial in using your phone: (872) 240-3412
Access Code: 440-562-989

The District reserves the right to issue addenda to this IFB as a result of inquiries received, or to make adjustments to its project schedule if it is deemed in the District's best interest to do so. The District further reserves the right to reject any and all Proposals resulting from this RFP if the District deems that it is in the best interest of the District to do so.

5. SITE INSPECTION

Information contained in these documents is provided in good faith only that all Proposers may have access to the same information utilized by the District, and is not intended as a substitute for personal investigations, interpretations and judgment of the Proposer. As information may be approximated or incomplete, Proposers should conduct a thorough inspection, review of existing conditions of the site and compare it to the specifications and drawings. Any discrepancies or needs for clarifications must be raised as indicated in Paragraph 3, above.

Submission of a bid shall be evidence that the Proposer has examined the site, compared it with the drawings and specifications and satisfied itself of the conditions existing at the site, the storage and handling of materials, and all other matters incidental to the work under this contract. No additional compensation will be allowed for difficulties which the Proposer could have discovered or reasonably anticipated prior to bidding.

6. COMMENCEMENT OF SERVICES

It is the intent of the District to execute an agreement with the successful bidder, to commence in October of 2020. Work under this contractual agreement will be spread over multiple phases. The District will work with the awarded contractor on determining the phased project timeline.

7. FUNDING

Any contract resulting from this Invitation for Bids is subject to a financial assistance contract between the District and the Federal Transit Administration and between the District and the State of Connecticut Department of Transportation. All firms will be required to certify that they are not on the U.S. Department of Transportation's list of ineligible contractors. Further, the contractor will be required to comply with all applicable equal employment opportunity laws and regulations.

No bids will be accepted from, or a Contract awarded to any person, firm, or corporation that is in arrears or is in default to the State of Connecticut upon any debt or contract or

that is in default as a surety or in any other manner is in default of any obligation to the State. Additionally, no Contract shall be awarded to any person, firm, or corporation that has failed to perform on any prior or previous contract, agreement, or license with the State. Nor will any Contract be awarded to any firm that is not registered with the Secretary of State's Office to conduct business in the State of Connecticut.

8. FEDERAL GRANT REQUIREMENTS

Exhibit A attached hereto and made a part hereof sets forth federal requirements placed upon vendors who are participating in a project funded in whole or in part with Federal grants. Its provisions are hereby included herein as an integral part of this IFB.

9. STATE GRANT REQUIREMENTS

Contractor must comply with State Grant Requirements (Exhibit B).

10. PROCUREMENT AND APPEALS PROCESS

The District's procurement procedures and appeals process are contained in Exhibit C attached hereto and made a part hereof.

11. DISADVANTAGED BUSINESS ENTERPRISE

It is the policy of the District that disadvantaged business enterprises ("DBE's") be afforded the maximum opportunity to participate in the performance of all contracts let by the District. This participation may be in the form of prime contracts, and/or sub-contracts, and/or direct or general overhead items procured from DBEs allocated to the Services. The term "disadvantaged business enterprise" means a business enterprise that is at least 51% owned and controlled by one or more socially disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background, or other similar cause. Such persons would include but not be limited to citizens of the United States who are: African Americans (not of Hispanic origin); Hispanic Americans; Native Americans; Asian-Pacific Americans; and, women regardless of race and ethnicity. Proposers will submit a statement indicating its own DBE status and what subcontracts and/or overhead purchases with amounts thereof under this project it will let to comply with the District's DBE goal of **5%**.

If the Contractor is unable to achieve the specified contract goals, the Contractor must submit written documentation to the District indicating his/her good faith efforts to satisfy goal requirements.

The District is a part of the State of Connecticut Department of Transportation Unified Certification Program ("UCP") and any contractor and/or sub-contractor and/or vendor utilized to meet the DBE Participation requirements must be certified through that UCP. A list of Conn DOT Certified DBE vendors can be found at: http://www.biznet.ct.gov/dot_db/dbesearch.aspx. Upon request, the District will provide information related to the state certification process.

12. VALIDITY OF PROPOSALS

Bidders agree that their proposals remain valid for a period of one hundred and eighty (180) days after the above cited due date for submission of bids and may be extended beyond that time by mutual agreement.

By responding to this IFB, the bidder implicitly states that the bid is not made in connection with any competing firm submitting a separate response to this IFB, and is in all respects fair and without collusion or fraud. It is further implied that the bidder did not participate in the District's IFB development process, had no knowledge of the specific contents of this IFB prior to its issuance, and that no employee of the District participated directly or indirectly in the firm's bid preparation.

Please note that the costs associated with the preparation of a Bid are the sole responsibility of the applicable Bidder. Bidder shall not include any such expenses as part of the price proposed in response to the IFB.

13. INFORMATION TO BIDDERS

(a) Discrepancy in Bid Documents

If a bidder becomes aware of any discrepancy, ambiguity, error or omission in this solicitation package, he or she shall report it to District's representative, LaShaunda Drake, ldrake@ghtd.org, Greater Hartford Transit District, One Union Place, Hartford, CT 06103. The District will determine the necessity for clarification and may issue addenda as a result.

Any interpretation, change, clarification or correction in the bid documents will be made only by written instrument(s) issued by the District. Copies of such instrument(s) will be emailed or delivered to each person, firm or corporation which has received this IFB document.

(b) Brand Names

If present, brand, manufacturer or product names are indicated in the specifications only for the purpose of establishing identification and a general description of the item(s) sought. Items of equal quality, not bearing such names, may be submitted in the bid, provided however that prior approval for the item is obtained from the District.

(c) Requests for Clarification/Approved Equal Status

Requests for clarification of specifications and any protest of specifications must be received by the District, in writing, to LaShaunda Drake at ldrake@ghtd.org on or before **12:00 p.m. local time on Monday, August 24, 2020**. Responses shall be in writing and posted in the form of an addendum and will be distributed to all known recipients of the IFB document.

Approved Equal Status

In all cases, materials must be furnished as specified. Where brand names or specific items are used in the specifications, consider the term "or approved equal" to follow. Any unapproved deviations, exceptions, substitutions, alternates or conditional qualifications contained in a proposal may be cause for its rejection. If potential contractors believe that their product is an equal to the product specified, they must submit a written request to District in triplicate and this request will be approved or rejected by the District at least fifteen (15) calendar days prior to the scheduled opening of the bids. Requests for approved equals must be received by the District in writing by **12:00 p.m. local time on Wednesday, August 19, 2020**.

Any request for an approved equal must be fully supported with catalog information, specifications and illustrations or other pertinent information as evidence that the substitute offered is equal to or better than the specification. Where an approved equal is requested, the contractor must clearly demonstrate the equality of this product to the District to determine whether the proposer's product is or is not equal to that specified. An Approved Equal Form is included in Exhibit E. Further changes in the specifications will be made by addendum.

(d) Obligations of the Proposer

At the time of the opening of proposals, each Proposer will be presumed to be thoroughly familiar with the IFB requirements, and the objectives for each element of the project, item, or service. A plea of mistake in the accepted response shall not be available to the Proposer for the recovery of the bid surety or as a defense to any action based upon an accepted response.

(e) Omission of Details

No advantage shall be taken by the Proposer in the omission of any part or detail which is required to make the project complete and ready for service, even though such part of detail is not mentioned explicitly in the specifications. All units or parts not herein specified shall be manufacturer's standard units and shall conform to the highest standard in the industry.

(f) Qualification of Bidders

Contractor shall submit documentation of Qualifications to perform the work of this contract. Qualifications at a minimum will include CT license, list of projects of similar scope (subject and cost) for last five (5) years, references from past Owners for this kind of work, and any other materials that will provide assurance that Contractor has qualifications for the work. The District may make such investigations as deemed necessary to determine the ability of the Candidate to perform the work and the degree to which any Candidate meets the criteria for award listed herein. A Statement of Bidders Qualification is included in Exhibit E.

(f) Determination of Successful Bidder

In determining the successful bidder, consideration will be given to price, financial responsibility of the bidder, responsiveness to the specifications, warranty, suitability of the product offered for use, past experience, financial ability to meet the contract, facilities and equipment, availability of labor, delivery promise, terms of payment, and other objective and accountable factors which are reasonable.

Award of any contract from this Invitation for Bids shall be made to the bidder quoting the lowest total computed base bid, including delivery charges, and payment terms, but excluding alternate bid items, as described in the Bid (where applicable), provided the bid is responsive in all respects to the procurement requirements.

All materials, parts and equipment furnished by the contractor shall be new, high grade and free from defects. Materials and workmanship not conforming to the requirements of the specifications shall be considered defective and will be subject to rejection.

If the contractor fails to replace any defective or damaged work or materials after reasonable notice, the District may cause such work or materials to be replaced. The replacement expenses shall be deducted from the amount to be paid to the contractor.

The District may inspect all material and workmanship at any time during the progress of the work and shall have the right to reject all materials and workmanship which does not conform to the specifications or which is not considered to be of adequate quality.

(g) Disqualification of Bidders

Proposers may be disqualified and bids may be rejected for any of, but not limited to, the following causes:

- Failure to use Bid Proposal Form furnished by the District
- Lack of signature by an authorized representative on the Bid Proposal Form
- Failure to properly complete the Bid Proposal form
- Evidence of collusion among bidders
- Unauthorized alteration of Bid Proposal Form
- Failure to submit signed required certifications

The District reserves the right to waive any minor informality or irregularity.

14. QUANTITIES AND/OR USAGES

Quantities and/or usages are estimates only and in no way represent a commitment and/or intent to purchase the estimated amount. Actual quantities and delivery locations may vary. The District reserves the right to order all quantities that may be needed, at the contract price, during the contract term regardless of the estimates provided in this IFB.

15. SAMPLES

Samples are furnished free of charge and may be held for comparison with deliveries. Proposers must arrange for their return if desired. Samples are assumed to meet, at a minimum, District specifications for quality. All deliveries shall have at least the same quality as the accepted proposal sample. Latent deficiencies will be remedied by the contractor at no additional cost, or loss of service, to the District.

16. PAYMENT OF PREVAILING WAGES/DAVIS BACON WAGE RATES

The Proposer agrees that the contractor's laborers and mechanics and any subcontractor's, of any tier, laborers and mechanics who work on this project and who fall within any job classification established and published by the Connecticut Department of Labor shall be paid, at a minimum, the prevailing wage rates as certified by said Department. Each contractor and subcontractor of any tier performing work on this project shall post on the project the applicable prevailing wage rates and hourly basic rates of pay for the County or area within which the project is being performed, including the effective date of any changes thereof, in at least one conspicuous place for the information of the employees working on the project. The information so posted shall include a breakdown of contributions for health and welfare benefits, vacation benefits, pension benefits and any other economic benefit required to be paid. See Exhibit A: Federal Requirements for more details. See Exhibit G for Prevailing Wage Rates.

17. BONDING REQUIREMENTS

Each bid must be accompanied by Bid Security made payable to the District in an amount of five percent (5%) of Bidder's maximum Bid Price and in the form of cash, a certified or cashier's check, or a Bid Bond, issued by a surety. The Bid Security shall be sealed in a separate envelope containing the Bid.

In addition, a performance bond from a licensed bonding agent in the State of Connecticut shall be required for the Contract amount (100%) for the faithful performance of the work. A payment bond equal to forty percent (40%) of the Contract amount is also required from a licensed bonding agent in the State of Connecticut.

18. SINGLE BIDDER/SOLE SOURCE PROCUREMENT

In the event that a single bid is received, the District will conduct a price and/or cost analysis and review and audit all business records and related documents of the Bidder and any affiliated or parent company to determine the fairness and reasonableness of the bid. A price analysis is the process of examining the bid and evaluating a prospective price without evaluating separate cost elements. It should be recognized that a price analysis through comparison to other similar procurements must be based on an established or competitive price of the elements used in the comparisons. The comparison must be made to a purchase of similar quantity and involving similar specifications. Where a difference exists, a detailed analysis must be made of this difference and costs attached thereto.

Where it is impossible to obtain a valid price analysis, it may be necessary for the District to conduct a cost analysis of the bid price. The price and/or cost analysis shall be made by competent and experienced auditors or price analysis; an engineer's estimate or comparison of the prices is insufficient.

The Federal Transit Administration (FTA) may be asked to lend support in obtaining the services of the Defense Contract Audit Agency, if necessary. The District will submit to FTA all data and analysis of determination prior to award of a sole source contract.

19. WITHDRAWAL OF BIDS

Bids may be withdrawn only by written request. For bids already submitted, written request to withdraw must be delivered to the District prior to bid opening. All bids opened will be considered to be valid offers and may not be withdrawn for a period of one hundred and eighty (180) business days following the opening of the bids, unless the bidder is given written notice that its bid is not responsive to the specifications of this IFB.

20. SUBCONTRACTING

If subcontractors are necessary to complete any functions of this requirement, the Proposer must list the names and business locations of any proposed subcontractors, using the Subcontractor Form. The District reserves the right to review and approve any subcontractors proposed by the Respondent. Any approval of the subcontractor shall not be construed as making the District party of such contract, giving the subcontractor privities of contract with the District, or subjecting the District to liability of any kind to any subcontractor.

21. CONTRACTING

The District reserves the right to require the successful candidate to execute a contract in a format supplied by the District. The terms and conditions of the contract to be signed upon the award of the IFB will supersede any inconsistent provisions of the IFB documents.

The award of any contract is subject to the following conditions and contingencies:

1. The approval of such governmental agencies as may be required by law.
2. The appropriation of adequate funds by the proper agencies.
3. Compliance with all applicable laws, regulations, ordinances and codes of the United States and, the state of Connecticut.
4. The selected Proposer must be current in all tax or any other monetary obligation owed to the State of Connecticut.
5. The selected Candidate must have a current EEO certification on file with the State.

Contract Documents

The Contract Documents consist of the AIA Contract, this Invitation for Bids (IFB) and its reference documents, drawings, any Addenda issued, the Contractor's response to the IFB, the federal Requirements (Exhibit A), other documents listed in the Contract, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by the 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 Design Professional on behalf of the District.

22. RETAINAGE

When progress payments are being made for items being built, the District will withhold 5% of the total project cost, or as otherwise specified in the contract for this project.

23. ASSIGNMENT

The contractor shall not assign, transfer, convey or otherwise dispose of the agreement or his/her or its interest in the same, or any part thereof, without prior written approval of the District.

24. REQUIRED CERTIFICATIONS

The required certifications must be submitted with the bid form for the proposal to be considered responsive to the bid specifications. All certification forms are contained in Exhibit E. Those bids which do not contain the required standard certifications, complete and signed as appropriate, will be determined ineligible.

25. INSURANCE REQUIREMENTS

Contractor shall obtain and maintain throughout the term of this Contract (or such longer period as may be specified below, if any) the following insurance:

A. Commercial General Liability

The Contractor shall carry Commercial General Liability Insurance, including a broad form comprehensive general liability endorsement and coverage against claims for personal injury, bodily injury, death or property damage, to be on the so-called "occurrence" form with a combined limit of not less than Two Million Dollars (\$2,000,000)

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in the aggregate and One Million Dollars (\$1,000,000) per occurrence, and to cover at least the following hazards: (1) premises and operations; (2) products and completed operations on an "if any" basis; (3) independent contractors; (4) blanket contractual liability for all insured contracts; and (5) contractual liability covering the indemnities in this Contract.

B. Workers' Compensation Insurance

With respect to all services the Contractor performs and all those performed for the Contractor by its subcontractors, the Contractor and its subcontractor(s) shall carry Workers' Compensation Insurance and, as applicable, insurance required in accordance with the U.S. Longshore and Harbor Workers' Compensation Act, in accordance with the requirements of the laws of the State of Connecticut, and of the laws of the United States, respectively.

C. Business Automobile Insurance

Business Automobile Liability Insurance, to cover the use of all owned, hired, and non-owned vehicles, providing for the following minimum liability limits: One Million Dollars (\$1,000,000) for all damages arising out of bodily injuries to or death of all persons in any one accident or occurrence, and for all damages arising out of injury to or destruction of property in any one accident or occurrence. In cases where the insurance policy shows an aggregate limit as part of the automobile liability coverage, the aggregate limit must be at least Two Million Dollars (\$2,000,000).

D. Professional Liability Insurance.

If the Contractor or any of its subcontractors are providing design, architectural or engineering services with respect to this Contract, the Contractor and such subcontractors shall carry Professional Liability Insurance Policy in an annual aggregate amount not less than Two Million Dollars (\$2,000,000), which coverage shall be maintained in force for a period of not less than three (3) years after the completion of the work under this Contract.

E. Certificate of Insurance

All insurance provided for above shall be obtained under valid and enforceable policies, and issued by financially sound and responsible insurance companies authorized to do business in the State of Connecticut and having a general policy rating of A- or better and a financial class of VIII or better, each as determined by AM Best Company, Inc. Prior to commencing any work under this Contract and at least ten (10) days prior to the expiration dates of any insurance required hereunder, Contractor shall deliver to the District certificates of insurance evidencing such coverage and any renewal or successor policies. If the Contractor engages any subcontractor to perform any of its obligations under this Contract, the Contractor shall also deliver to the District certificates of insurance from such subcontractor evidencing such coverage and any renewal or successor policies. All policies of insurance required hereunder shall name the District (and such other persons or entities designated by the District) as an additional insured (except the workers' compensation and Professional Liability insurance). For the Workers' Compensation Insurance and, as applicable, U.S. Longshore and Harbor Workers' Compensation Act coverage, the policy number(s) and term of the policy (ies) shall be indicated on the certificate. With the exception of Professional Liability Insurance, each insurance policy shall state that the insurance company agrees to investigate and defend the insured against all claims for damages, even if groundless.

All insurance policies provided for above shall contain clauses or endorsements to the effect that: (i) no act or negligence of the Contractor, or anyone acting for the Contractor, or failure to comply with the provisions of any policy, which might otherwise result in a forfeiture of the insurance or any part thereof, shall in any way affect the validity or enforceability of the insurance insofar as the District is concerned; (ii) no such policies shall be canceled without at least thirty (30) days' notice to the District (10 days for non-payment of premium); (iii) shall contain a waiver of subrogation in favor of the District, and (iv) shall provide that such coverage is primary and non-contributory.

Such insurance shall protect the District against all claims, liabilities, suits, actions, damages, or costs resulting from or arising out of the ownership, lease, operation, maintenance, repairs, or use in any way of any project equipment for the purposes of the program covered by this Contract and for any other purpose. No project equipment shall be delivered to the Contractor, or operated by the Contractor until the Contractor has delivered the certificate(s) of insurance required hereunder. Prior to the annual renewal of a motor vehicle registration, the Contractor shall submit to the District a certificate of insurance for the project equipment. This Section shall not prevent the District from contracting for such required insurance coverage at any time, and in such event the Contractor shall pay the District for all costs of such insurance.

F. Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the District and its officers, directors, employees and agents (collectively "Indemnified Parties") from and against all claims, damages, demands, losses, expenses, fines, penalties, causes of action, suits or other liabilities (including all costs of reasonable attorneys' fees) arising out of, related to, in connection with or resulting from, or alleged to arise out of or arise from the negligent acts or omissions, breach or failure to perform under the Contract or the violation of any applicable law or regulation, by Contractor, Contractor's subcontractors or anyone directly or indirectly employed by Contractor or by Contractor's subcontractors or anyone for whose acts any of them may be responsible or liable and whether such claim, damage, demand, loss, expense, fine, penalty, cause of action, suit or other liability is attributable to bodily injury, personal injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom. This indemnity shall be effective regardless of whether or not such claim, damage, loss or expense is caused in part by any of the Indemnified Parties (but the indemnity shall not cover liability to the extent resulting from gross negligence or willful misconduct of the Indemnified Parties). Such indemnity obligation shall not be in derogation or limitation of any other obligation or liability of the Contractor or the rights of the District contained in this Contract or otherwise. This indemnification shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor under any workers' compensation acts, disability benefit acts or other employee benefits acts and includes any loss or injury suffered by an employee of Contractor. This indemnification shall survive the completion of the Work or the termination of the Contract.

To the extent the foregoing Indemnity applies to any violation of federal, state or local laws, ordinances or regulations, Contractor shall do and perform all work necessary to correct such violation.

26. NOTICE OF AWARD

The selected proposer will be provided with a written Notice of Award which shall be contingent upon the submission by the respondent of all documents required including, but not limited to, proper insurance certificates, performance and payment bonds, verification of DBE percentage contribution to the work and execution of contract within 10 days of the notice of award.

27. ATTACHED EXHIBITS

The following attachments are included in this package:

EXHIBIT A

- Federally Required Contract Clauses

EXHIBIT B

- State of Connecticut Grant Requirements

EXHIBIT C

- Procurement Procedures and Appeals Process

EXHIBIT D

- Bid Proposal Form

EXHIBIT E

- Required Certifications
 - Affidavit
 - Certificate of Eligibility
 - Certificate of Non-Collusion.
 - Certificate of Restrictions on Lobbying
 - Contractor's Statement on Sub-Contractors
 - Certificate for Disadvantaged Business Enterprise
 - DBE Good Faith Efforts Documentation Form
 - DBE Letter of Intent
 - Buy America Certification
 - Approved Equal Form
 - Statement of Bidder's Qualifications

EXHIBIT F

- State of Connecticut Contract Requirements

EXHIBIT G

- Connecticut Department of Labor Prevailing Wage Bid Package

EXHIBIT H

- Technical Specifications and Special Provisions

EXHIBIT A
FEDERALLY REQUIRED CONTRACT CLAUSES

FEDERALLY REQUIRED CONTRACT CLAUSES

No Government Obligation to Third Parties –

(1) The recipient and contractor acknowledge and agree that, notwithstanding any concurrence by the US Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the US Government, the US Government is not a party to this contract and shall not be subject to any obligations or liabilities to the recipient, the contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) Contractor agrees to include the above clause in each subcontract financed in whole or in part with FTA assistance. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

Program Fraud and False or Fraudulent Statements or Related Acts –

(1) Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 USC 3801 et seq. and USDOT regulations, "Program Fraud Civil Remedies," 49 CFR 31, apply to its actions pertaining to this project. Upon execution of the underlying contract, contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submittal, or certification, the US Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act (1986) on contractor to the extent the US Government deems appropriate.

(2) If contractor makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submittal, or certification to the US Government under a contract connected with a project that is financed in whole or in part with FTA assistance under the authority of 49 USC 5307, the Government reserves the right to impose the penalties of 18 USC 1001 and 49 USC 5307(n)(1) on contractor, to the extent the US Government deems appropriate.

(3) Contractor shall include the above two clauses in each subcontract financed in whole or in part with FTA assistance. The clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

Access to Records –

The following access to records requirements apply to this Contract:

1. Where the purchaser is not a State but a local government and is an FTA recipient or a subgrantee of FTA recipient in accordance with 49 CFR 18.36(i), contractor shall provide the purchaser, the FTA, the US Comptroller General or their authorized representatives access to any books, documents, papers and contractor records which are pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor shall also, pursuant to 49 CFR 633.17, provide authorized FTA representatives, including any PMO contractor, access to contractor's records and construction sites pertaining to a capital project, defined at 49 USC 5302(a)1, which is receiving FTA assistance through the programs described at 49 USC 5307, 5309 or 5311.

2. Where the purchaser is a State and is an FTA recipient or a subgrantee of FTA recipient in accordance with 49 CFR 633.17, contractor shall provide the purchaser, authorized FTA representatives, including any PMO Contractor, access to contractor's records and construction sites pertaining to a capital project, defined at 49 USC

5302(a)1, which receives FTA assistance through the programs described at 49 USC 5307, 5309 or 5311. By definition, a capital project excludes contracts of less than the simplified acquisition threshold currently set at \$250,000.

3. Where the purchaser enters into a negotiated contract for other than a small purchase or under the simplified acquisition threshold and is an institution of higher education, a hospital or other non-profit organization and is an FTA recipient or a subgrantee of FTA recipient in accordance with 49 CFR 19.48, contractor shall provide the purchaser, the FTA, the US Comptroller General or their authorized representatives, access to any books, documents, papers and record of the contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions.

4. Where a purchaser which is an FTA recipient or a subgrantee of FTA recipient in accordance with 49 USC 5325(a) enters into a contract for a capital project or improvement (defined at 49 USC 5302(a)1) through other than competitive bidding, contractor shall make available records related to the contract to the purchaser, the Secretary of USDOT and the US Comptroller General or any authorized officer or employee of any of them for the purposes of conducting an audit and September 2019 inspection.

5. Contractor shall permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

6. Contractor shall maintain all books, records, accounts and reports required under this contract for a period of not less than three (3) years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case contractor agrees to maintain same until the recipient, FTA Administrator, US Comptroller General, or any of their authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Re: 49 CFR 18.39(i)(11).

FTA does not require the inclusion of these requirements in subcontracts.

Federal Changes -

Contractor shall comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the recipient and FTA, as they may be amended or promulgated from time to time during the term of the contract. Contractor's failure to comply shall constitute a material breach of the contract.

Civil Rights –The following requirements apply to the underlying contract:

The Recipient understands and agrees that it must comply with applicable Federal civil rights laws and regulations, and follow applicable Federal guidance, except as the Federal Government determines otherwise in writing. Therefore, unless a Recipient or Program, including an Indian Tribe or the Tribal Transit Program, is specifically exempted from a civil rights statute, FTA requires compliance with that civil rights statute, including compliance with equity in service:

a. Nondiscrimination in Federal Public Transportation Programs. The Recipient agrees to, and assures that each Third Party Participant will, comply with Federal transit law, 49 U.S.C. § 5332 (FTA's "Nondiscrimination" statute): (1) FTA's "Nondiscrimination" statute prohibits discrimination on the basis of: (a) Race, (b) Color, (c) Religion, (d) National origin, (e) Sex, (f) Disability, (g) Age, or (h) Gender identity and (2) The FTA "Nondiscrimination" statute's prohibition against discrimination includes: (a) Exclusion from participation, (b) Denial of program benefits, or (c) Discrimination, including

discrimination in employment or business opportunity, (3) Except as FTA determines otherwise in writing: (a) General. Follow: 1 The most recent edition of FTA Circular 4702.1, "Title VI Requirements and Guidelines for Federal Transit Administration Recipients," to the extent consistent with applicable Federal laws, regulations, and guidance, and 2 Other applicable Federal guidance that may be issued, but (b) Exception for the Tribal Transit Program. FTA does not require an Indian Tribe to comply with FTA program-specific guidelines for Title VI when administering its projects funded under the Tribal Transit Program,

b. Nondiscrimination – Title VI of the Civil Rights Act. The Recipient agrees to, and assures that each Third Party Participant will: (1) Prohibit discrimination based on: (a) Race, (b) Color, or (c) National origin, (2) Comply with: (a) Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000d et seq., (b) U.S. DOT regulations, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964," 49 C.F.R. part 21, and (c) Federal transit law, specifically 49 U.S.C. § 5332, as stated in the preceding section a, and (3) Except as FTA determines otherwise in writing, follow: (a) The most recent edition of FTA Circular 4702.1, "Title VI and Title VI-Dependent Guidelines for Federal Transit Administration Recipients," to the extent consistent with applicable Federal laws, regulations, and guidance. (b) U.S. DOJ, "Guidelines for the enforcement of Title VI, Civil Rights Act of 1964," 28 C.F.R. § 50.3, and (c) Other applicable Federal guidance that may be issued,

c. Equal Employment Opportunity. (1) Federal Requirements and Guidance. The Recipient agrees to, and assures that each Third Party Participant will, prohibit discrimination on the basis of race, color, religion, sex, or national origin, and: (a) Comply with Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000e et seq., (b) Facilitate compliance with Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order No. 11246, Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note, (c) Comply with Federal transit law, specifically 49 U.S.C. § 5332, as stated in section a, and (d) Comply with FTA Circular 4704.1 other applicable EEO laws and regulations, as provided in Federal guidance, including laws and regulations prohibiting discrimination on the basis of disability, except as the Federal Government determines otherwise in writing, (2) General. The Recipient agrees to: (a) Ensure that applicants for employment are employed and employees are treated during employment without discrimination on the basis of their: 1 Race, 2 Color, 3 Religion, 4 Sex, 5 Disability, 6 Age, or 7 National origin, (b) Take affirmative action that includes, but is not limited to: 1 Recruitment advertising, 2 Recruitment, 3 Employment, 4 Rates of pay, 5

Other forms of compensation, 6 Selection for training, including apprenticeship, 7 Upgrading, 8 Transfers, 9 Demotions, 10 Layoffs, and 11 Terminations, but (b) Indian Tribe. Title VII of the Civil Rights Act of 1964, as amended, exempts Indian Tribes under the definition of "Employer". (3) Equal Employment Opportunity Requirements for Construction Activities. In addition to the foregoing, when undertaking "construction" as recognized by the U.S. Department of Labor (U.S. DOL), the Recipient agrees to comply, and assures the compliance of each Third Party Participant, with: (a) U.S. DOL regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. chapter 60, and

(b) Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order No. 11246, Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note,

d. Disadvantaged Business Enterprise. To the extent authorized by applicable Federal law, the Recipient agrees to facilitate, and assures that each Third Party Participant will facilitate, participation by small business concerns owned and controlled by socially and economically disadvantaged individuals, also referred to as "Disadvantaged Business Enterprises" (DBEs), in the Project as follows: 1) Requirements. The Recipient agrees to comply with: (a) Section 1101(b) of Map-21, 23 U.S.C. § 101 note, (b) U.S. DOT regulations, "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs," 49 C.F.R. part 26, and (c) Federal transit law, specifically 49 U.S.C. § 5332, as stated in section a, (2) Assurance. As required by 49 C.F.R. § 26.13(a), (b) DBE Program Requirements. Recipients receiving planning, capital and/or operating assistance that will award prime third party contracts exceeding \$250,000 in a Federal fiscal year must: 1 Have a DBE program meeting the requirements of 49 C.F.R. part 26, 2 Implement a DBE program approved by FTA, and 3 Establish an annual DBE participation goal, (c) Special Requirements for a Transit Vehicle Manufacturer. The Recipient understands and agrees that each transit vehicle manufacturer, as a condition of being authorized to bid or propose on FTA-assisted transit vehicle procurements, must certify that it has complied with the requirements of 49 C.F.R. part 26,

(d) the Recipient provides assurance that: The Recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 C.F.R. part 26. The Recipient shall take all necessary and reasonable steps under 49 C.F.R. part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The Recipient's DBE program, as required by 49 C.F.R. part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the Recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under 49 C.F.R. part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. § 1001 and/or the Program Fraud Civil Remedies Act of 1986, 31 U.S.C. § 3801 et seq., (2) Exception for the Tribal Transit Program. FTA exempts Indian tribes from the Disadvantaged Business Enterprise regulations at 49 C.F.R. part 26 under Map-21 and previous legislation,

e. Nondiscrimination on the Basis of Sex. The Recipient agrees to comply with Federal prohibitions against discrimination on the basis of sex, including: (1) Title IX of the Education Amendments of 1972, as amended, 20 U.S.C. § 1681 et seq., (2) U.S. DOT regulations, "Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance," 49 C.F.R. part 25, and (3) Federal transit law, specifically 49 U.S.C. § 5332, as stated in section a,

f. Nondiscrimination on the Basis of Age. The Recipient agrees to comply with Federal prohibitions against discrimination on the basis of age, including: (1) The Age Discrimination in Employment Act (ADEA), 29 U.S.C. §§ 621 – 634, which prohibits discrimination on the basis of age, (2) U.S. Equal Employment Opportunity Commission (U.S. EEOC) regulations, "Age Discrimination in Employment Act," 29 C.F.R. part 1625, which implements the ADEA, (3) The Age Discrimination Act of 1975,

as amended, 42 U.S.C. § 6101 et seq., which prohibits discrimination against individuals on the basis of age in the administration of programs or activities receiving Federal funds, (4) U.S. Health and Human Services regulations, "Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance," 45 C.F.R. part 90, which implements the Age Discrimination Act of 1975, and (5) Federal transit law, specifically 49 U.S.C. § 5332, as stated in section a,

g. Nondiscrimination on the Basis of Disability. The Recipient agrees to comply with the following Federal prohibitions pertaining to discrimination against seniors or individuals with disabilities: (1) Federal laws, including: (a) Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of disability in the administration of federally funded programs or activities, (b) The Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. § 12101 et seq., which requires that accessible facilities and services be made available to individuals with disabilities, 1 General. Titles I, II, and III of the ADA apply to FTA Recipients, but 2 Indian Tribes. While Titles II and III of the ADA apply to Indian Tribes, Title I of the ADA exempts Indian Tribes from the definition of "employer," (c) The Architectural Barriers Act of 1968, as amended, 42 U.S.C. § 4151 et seq., which requires that buildings and public accommodations be accessible to individuals with disabilities, (d) Federal transit law, specifically 49 U.S.C. § 5332, which now includes disability as a prohibited basis for discrimination, and (e) Other applicable laws and amendments pertaining to access for elderly individuals or individuals with disabilities, (2) Federal regulations, including: (a) U.S. DOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," 49 C.F.R. part 37, (b) U.S. DOT regulations, "Nondiscrimination on the Basis of Disability in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. part 27, (c) U.S. DOT regulations, "Transportation for Individuals with Disabilities: Passenger Vessels," 49 C.F.R. part 39, (d) Joint U.S. Architectural and Transportation Barriers Compliance Board (U.S. ATBCB) and U.S. DOT regulations, "Americans With Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 36 C.F.R. part 1192 and 49 C.F.R. part 38, (e) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services," 28 C.F.R. part 35, (f) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities," 28 C.F.R. part 36, (g) U.S. EEOC, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. part 1630, (h) U.S. Federal Communications Commission regulations, "Telecommunications Relay Services and Related Customer Premises Equipment for Persons with Disabilities," 47 C.F.R. part 64, Subpart F, (i) U.S. ATBCB regulations, "Electronic and Information Technology Accessibility Standards," 36 C.F.R. part 1194, and (j) FTA regulations, "Transportation for Elderly and Handicapped Persons," 49 C.F.R. part 609, and (3) Other applicable Federal civil rights and nondiscrimination guidance,

h. Drug or Alcohol Abuse - Confidentiality and Other Civil Rights Protections. The Recipient agrees to comply with the confidentiality and civil rights protections of: (1) The Drug Abuse Office and Treatment Act of 1972, as amended, 21 U.S.C. § 1101 et seq., (2) The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, as amended, 42 U.S.C. § 4541 et seq., and (3) The Public Health Service Act, as amended, 42 U.S.C. §§ 290dd – 290dd-2,

i. Access to Services for People with Limited English Proficiency. Except as the Federal Government determines otherwise in writing, the Recipient agrees to promote accessibility of public transportation services to people whose understanding of English is limited by following: 1) Executive Order No. 13166, "Improving Access to Services for Persons with Limited English Proficiency," August 11, 2000, 42 U.S.C. § 2000d-1 note, and (2) U.S. DOT Notice, "DOT Policy Guidance Concerning Recipients' Responsibilities to Limited English Proficiency (LEP) Persons," 70 Fed. Reg. 74087, December 14, 2005,

j. Other Nondiscrimination Laws. Except as the Federal Government determines otherwise in writing, the Recipient agrees to: (1) Comply with other applicable Federal nondiscrimination laws and regulations, and (2) Follow Federal guidance prohibiting discrimination.

k. Remedies. Remedies for failure to comply with applicable Federal Civil Rights laws and Federal regulations may be enforced as provided in those Federal laws or Federal regulations.

Energy Conservation –Contractor shall comply with mandatory standards and policies relating to energy efficiency, stated in the state energy conservation plan issued in compliance with the Energy Policy & Conservation Act.

Termination –

a. Termination for Convenience. (General Provision) the recipient may terminate this contract, in whole or in part, at any time by written notice to contractor when it is in the recipient's best interest. Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. Contractor shall promptly submit its termination claim to the recipient. If contractor is in possession of any of the recipient's property, contractor shall account for same, and dispose of it as the recipient directs.

b. Termination for Default. [Breach or Cause] (General Provision) If contractor does not deliver items in accordance with the contract delivery schedule, or, if the contract is for services, and contractor fails to perform in the manner called for in the contract, or if contractor fails to comply with any other provisions of the contract, the recipient may terminate this contract for default. Termination shall be effected by serving a notice of termination to contractor setting forth the manner in which contractor is in default. Contractor shall only be paid the contract price for supplies delivered and accepted, or for services performed in accordance with the manner of performance set forth in the contract. If it is later determined by the recipient that contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of contractor, the recipient, after setting up a new delivery or performance schedule, may allow contractor to continue work, or treat the termination as a termination for convenience.

c. Opportunity to Cure. (General Provision) the recipient in its sole discretion may, in the case of a termination for breach or default, allow contractor an appropriately short period of time in which to cure the defect. In such case, the notice of termination shall state the time period in which cure is permitted and other appropriate conditions. If contractor fails to remedy to the recipient's satisfaction the breach or default or any of the terms, covenants, or conditions of this Contract within ten (10) days after receipt by contractor or written notice from the recipient setting forth the nature of said breach or default, the recipient shall have the right to terminate the Contract without any further

obligation to contractor. Any such termination for default shall not in any way operate to preclude the recipient from also pursuing all available remedies against contractor and its sureties for said breach or default.

d. Waiver of Remedies for any Breach in the event that the recipient elects to waive its remedies for any breach by contractor of any covenant, term or condition of this Contract, such waiver by the recipient shall not limit its remedies for any succeeding breach of that or of any other term, covenant, or condition of this Contract.

e. Termination for Convenience (Professional or Transit Service Contracts) the recipient, by written notice, may terminate this contract, in whole or in part, when it is in the recipient's interest. If the contract is terminated, the recipient shall be liable only for payment under the payment provisions of this contract for services rendered before the effective date of termination.

f. Termination for Default (Supplies and Service) If contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension or if the contractor fails to comply with any other provisions of this contract, the recipient may terminate this contract for default. The recipient shall terminate by delivering to contractor a notice of termination specifying the nature of default. Contractor shall only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract. If, after termination for failure to fulfill contract obligations, it is determined that contractor was not in default, the rights and obligations of the parties shall be the same as if termination had been issued for the recipient's convenience.

g. Termination for Default (Transportation Services) If contractor fails to pick up the commodities or to perform the services, including delivery services, within the time specified in this contract or any extension or if contractor fails to comply with any other provisions of this contract, the recipient may terminate this contract for default. The recipient shall terminate by delivering to contractor a notice of termination specifying the nature of default. Contractor shall only be paid the contract price for services performed in accordance with the manner of performance set forth in this contract. If this contract is terminated while contractor has possession of the recipient goods, contractor shall, as directed by the recipient, protect and preserve the goods until surrendered to the recipient or its agent. Contractor and the recipient shall agree on payment for the preservation and protection of goods. Failure to agree on an amount shall be resolved under the Dispute clause. If, after termination for failure to fulfill contract obligations, it is determined that contractor was not in default, the rights and obligations of the parties shall be the same as if termination had been issued for the recipient's convenience.

h. Termination for Default (Construction) If contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified, or any extension, or fails to complete the work within this time, or if contractor fails to comply with any other provisions of this contract, the recipient may terminate this contract for default. the recipient shall terminate by delivering to contractor a notice of termination specifying the nature of default. In this event, the recipient may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. Contractor and its sureties shall be liable for any damage to the recipient

resulting from contractor's refusal or failure to complete the work within specified time, whether or not contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the recipient in completing the work. Contractor's right to proceed shall not be terminated nor shall contractor be charged with damages under this clause if:

1. Delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of contractor. Examples of such causes include: acts of God, acts of the recipient, acts of another contractor in the performance of a contract with the recipient, epidemics, quarantine restrictions, strikes, freight embargoes; and
2. Contractor, within 10 days from the beginning of any delay, notifies the recipient in writing of the causes of delay. If in the recipient's judgment, delay is excusable, the time for completing the work shall be extended. The recipient's judgment shall be final and conclusive on the parties, but subject to appeal under the Disputes clauses.

If, after termination of contractor's right to proceed, it is determined that contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if termination had been issued for the recipient's convenience.

i. Termination for Convenience or Default (Architect & Engineering) the recipient may terminate this contract in whole or in part, for the recipient's convenience or because of contractor's failure to fulfill contract obligations. The recipient shall terminate by delivering to contractor a notice of termination specifying the nature, extent, and effective date of termination. Upon receipt of the notice, contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the recipient all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process. If termination is for the recipient's convenience, it shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services. If termination is for contractor's failure to fulfill contract obligations, the recipient may complete the work by contract or otherwise and contractor shall be liable for any additional cost incurred by the recipient. If, after termination for failure to fulfill contract obligations, it is determined that contractor was not in default, the rights and obligations of the parties shall be the same as if termination had been issued for the recipient's convenience.

j. Termination for Convenience or Default (Cost-Type Contracts) the recipient may terminate this contract, or any portion of it, by serving a notice of termination on contractor. The notice shall state whether termination is for convenience of the recipient or for default of contractor. If termination is for default, the notice shall state the manner in which contractor has failed to perform the requirements of the contract. Contractor shall account for any property in its possession paid for from funds received from the recipient, or property supplied to contractor by the recipient. If termination is for default, the recipient may fix the fee, if the contract provides for a fee, to be paid to contractor in proportion to the value, if any, of work performed up to the time of termination. Contractor shall promptly submit its termination claim to the recipient and the parties shall negotiate the termination settlement to be paid to contractor. If termination is for the recipient's convenience, contractor shall be paid its contract close-out costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination. If, after serving a notice of termination for default, the recipient determines that contractor has an excusable reason for not performing, such as strike, fire, flood, events which are not the fault of and are beyond the control of contractor, the

recipient, after setting up a new work schedule, may allow contractor to continue work, or treat the termination as a termination for convenience.

Government-Wide Debarment and Suspension (Nonprocurement) –The Recipient agrees to the following:(1) It will comply with the requirements of 2 C.F.R. part 180, subpart C, as adopted and supplemented by U.S. DOT regulations at 2 C.F.R. part 1200, which include the following: (a) It will not enter into any arrangement to participate in the development or implementation of the Project with any Third Party Participant that is debarred or suspended except as authorized by: 1 U.S. DOT regulations, “Nonprocurement Suspension and Debarment,” 2 C.F.R. part 1200, 2 U.S. OMB, “Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement),” 2 C.F.R. part 180, including any amendments thereto, and 3 Executive Orders Nos. 12549 and 12689, “Debarment and Suspension,” 31 U.S.C. § 6101 note, (b) It will review the U.S. GSA “System for Award Management,” <https://www.sam.gov>, if required by U.S. DOT regulations, 2 C.F.R. part 1200, and (c) It will include, and require each of its Third Party Participants to include, a similar provision in each lower tier covered transaction, ensuring that each lower tier Third Party Participant: 1 Will comply with Federal debarment and suspension requirements, and 2 Reviews the “System for Award Management” at <https://www.sam.gov>, if necessary to comply with U.S. DOT regulations, 2 C.F.R. part 1200, and (2) If the Recipient suspends, debars, or takes any similar action against a Third Party Participant or individual, the Recipient will provide immediate written notice to the: (a) FTA Regional Counsel for the Region in which the Recipient is located or implements the Project, (b) FTA Project Manager if the Project is administered by an FTA Headquarters Office, or (c) FTA Chief Counsel.

Buy America – Contractor shall comply with 49 USC 5323(j) and 49 CFR 661, stating that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 CFR 661.7, and include software, microcomputer equipment and small purchases (currently less than \$150,000) made with capital, operating, or planning funds. Separate requirements for rolling stock are stated at 5323(j)(2)(C) and 49 CFR 661.11. Rolling stock must be manufactured in the US and have a minimum 60% domestic content for FY2016 and FY2017, a minimum 65% domestic content for FY2018 and FY2019 and a minimum 70% domestic content for FY2020 and beyond. A bidder or offeror shall submit appropriate Buy America certification to the recipient with all bids on FTA-funded contracts, except those subject to a general waiver. Proposals not accompanied by a completed Buy America certification shall be rejected as nonresponsive. This requirement does not apply to lower tier subcontractors.

Breaches and Dispute Resolution –Disputes arising in the performance of this contract which are not resolved by agreement of the parties shall be decided in writing by the recipient’s authorized representative. This decision shall be final and conclusive unless within ten days from the date of receipt of its copy, contractor mails or otherwise furnishes a written appeal to the recipient’s CEO. In connection with such appeal, contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the recipient’s CEO shall be binding upon contractor and contractor shall abide by the decision. FTA has a vested interest in the settlement of any violation of Federal law including the False Claims Act, 31 U.S.C. § 3729.

Performance During Dispute - Unless otherwise directed by the recipient, contractor shall continue performance under this contract while matters in dispute are being resolved. Claims for Damages - Should either party to the contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefore shall be made in writing to such other party within ten days after the first observance of such injury or damage.

Remedies - Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the recipient and contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the residing State.

Rights and Remedies - Duties and obligations imposed by the contract documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the recipient or contractor shall constitute a waiver of any right or duty afforded any of them under the contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

Lobbying –Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, as amended by the Lobbying Disclosure Act of 1995, P.L. 104-65 [to be codified at 2 U.S.C. § 1601, et seq.] - Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the recipient.

Clean Air – 1) Contractor shall comply with all applicable standards, orders or regulations pursuant to the Clean Air Act, 42 USC 7401 et seq. Contractor shall report each violation to the recipient and understands and agrees that the recipient will, in turn, report each violation as required to FTA and the appropriate EPA Regional Office. 2) Contractor shall include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with FTA assistance.

Clean Water – Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq. Contractor shall report each violation to the recipient and understands and agrees that the recipient shall, in turn, report each violation as required to FTA and the appropriate EPA Regional Office. Contractor shall include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with FTA assistance.

Cargo Preference - Contractor shall: a. use privately owned US-Flag commercial vessels to ship at least 50% of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for US flag commercial vessels; b. furnish within 20 working days following the loading date of shipments originating within the US or within 30 working days following the loading date of shipments originating outside the US, a legible copy of a rated, "on-board" commercial bill-of-lading in English for each shipment of cargo described herein to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the recipient (through contractor in the case of a subcontractor's bill-of-lading.) c. include these requirements in all subcontracts issued pursuant to this contract when the subcontract involves the transport of equipment, material, or commodities by ocean vessel.

Fly America Requirements – Contractor shall comply with 49 USC 40118 (the “Fly America” Act) in accordance with General Services Administration regulations 41 CFR 301-10, stating that recipients and subrecipients of Federal funds and their contractors are required to use US Flag air carriers for US Government financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a US flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. Contractor shall include the requirements of this section in all subcontracts that may involve international air transportation.

Davis-Bacon and Copeland Anti-Kickback Acts

– (1) Minimum wages - (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is

performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. (ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met: (1) Except with respect to helpers as defined as 29 CFR 5.2(n)(4), the work to be performed by the classification requested is not performed by a classification in the wage determination; and (2) The classification is utilized in the area by the construction industry; and (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and (4) With respect to helpers as defined in 29 CFR 5.2(n)(4), such a classification prevails in the area in which the work is performed. (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary. (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary. (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification. (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof. (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (v)(A) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met: (1) The work to be

performed by the classification requested is not performed by a classification in the wage determination; and (2) The classification is utilized in the area by the construction industry; and (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary. (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination with 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary. (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(v) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(2) **Withholding** - The recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the grantee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) **Payrolls and basic records** - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of

Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the recipient for transmission to the Federal Transit Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following: (1) That the payroll for the payroll period contains the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5 and that such information is correct and complete; (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3; (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract. (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code. (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Federal Transit Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) **Apprentices and trainees** - (i) Apprentices - Apprentices will be permitted to work at

less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division of the U.S. Department of Labor determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved. (ii) Trainees - Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In

addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal employment opportunity** - The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) **Compliance with Copeland Act requirements** - The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) **Subcontracts** - The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the Federal Transit Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) **Contract termination: debarment** - A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) **Compliance with Davis-Bacon and Related Act requirements** - All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) **Disputes concerning labor standards** - Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) **Certification of Eligibility** - (i) By entering into this contract, contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1). (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1). (iii) The penalty for making false statements is prescribed in 18 USC 1001.

Contract Work Hours & Safety Standards Act –

(1) **Overtime requirements** - No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages - In the event of any violation of the clause set forth in para. (1) of this section, contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in para. (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in para. (1) of this section.

(3) Withholding for unpaid wages and liquidated damages - the recipient shall upon its own action or upon written request of USDOL withhold or cause to be withheld, from any moneys payable on account of work performed by contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours & Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in para. (2) of this section.

(4) Subcontracts - Contractor or subcontractor shall insert in any subcontracts the clauses set forth in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. Prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in this section.

Bonding Requirements – FTA may accept the bonding policy and requirements of the recipient, provided that they meet the minimum requirements for construction contracts as follows:

a. A bid guarantee from each bidder equivalent to five (5) percent of the bid price. The "bid guarantees" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

b. A performance bond on the part to the Contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

c. A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment, as required by law, of all persons supplying labor and material in the execution of the work provided for in the contract. Payment bond amounts required from Contractors are as follows:

(1) 50% of the contract price if the contract price is not more than \$1 million;

(2) 40% of the contract price if the contract price is more than \$1 million but not more than \$5 million; or

(3) \$2.5 million if the contract price is more than \$5 million.

d. A cash deposit, certified check or other negotiable instrument may be accepted by a grantee in lieu of performance and payment bonds, provided the grantee has established a procedure to assure that the interest of FTA is adequately protected. An irrevocable letter of credit would also satisfy the requirement for a bond.

Bid Bond Requirements (Construction)

(a) Bid Security - A Bid Bond must be issued by a fully qualified surety company acceptable to (Recipient) and listed as a company currently authorized under 31 CFR, Part 223 as possessing a Certificate of Authority as described thereunder.

(b) Rights Reserved - In submitting this Bid, it is understood and agreed by bidder that the right is reserved by (Recipient) to reject any and all bids, or part of any bid, and it is agreed that the Bid may not be withdrawn for a period of [ninety (90)] days subsequent to the opening of bids, without the written consent of (Recipient).

It is also understood and agreed that if the undersigned bidder should withdraw any part or all of his bid within [ninety (90)] days after the bid opening without the written consent of (Recipient), shall refuse or be unable to enter into this Contract, as provided above, or refuse or be unable to furnish adequate and acceptable Performance Bonds and Labor and Material Payments Bonds, as provided above, or refuse or be unable to furnish adequate and acceptable insurance, as provided above, he shall forfeit his bid security to the extent of (Recipient's) damages occasioned by such withdrawal, or refusal, or inability to enter into an agreement, or provide adequate security therefor.

It is further understood and agreed that to the extent the defaulting bidder's Bid Bond, Certified Check, Cashier's Check, Treasurer's Check, and/or Official Bank Check (excluding any income generated thereby which has been retained by (Recipient) as provided in [Item x "Bid Security" of the Instructions to Bidders]) shall prove inadequate to fully recompense (Recipient) for the damages occasioned by default, then the undersigned bidder agrees to indemnify (Recipient) and pay over to (Recipient) the difference between the bid security and (Recipient's) total damages, so as to make (Recipient) whole.

The undersigned understands that any material alteration of any of the above or any of the material contained on this form, other than that requested, will render the bid unresponsive.

Performance and Payment Bonding Requirements (Construction)

The Contractor shall be required to obtain performance and payment bonds as follows:

(a) Performance bonds

1. The penal amount of performance bonds shall be 100 percent of the original contract price, unless the (Recipient) determines that a lesser amount would be adequate for the protection of the (Recipient).

2. The (Recipient) may require additional performance bond protection when a contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price. The (Recipient) may secure additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(b) Payment bonds

1. The penal amount of the payment bonds shall equal:

(i) Fifty percent of the contract price if the contract price is not more than \$1 million.

(ii) Forty percent of the contract price if the contract price is more than \$1 million but not more than \$5 million; or

(iii) Two and one half million if the contract price is more than \$5 million.

2. If the original contract price is \$5 million or less, the (Recipient) may require additional protection as required by subparagraph 1 if the contract price is increased.

Performance and Payment Bonding Requirements (Non-Construction)

(a) The following situations may warrant a performance bond:

1. (Recipient) property or funds are to be provided to the contractor for use in performing the contract or as partial compensation (as in retention of salvaged material).
2. A contractor sells assets to or merges with another concern, and the (Recipient), after recognizing the latter concern as the successor in interest, desires assurance that it is financially capable.
3. Substantial progress payments are made before delivery of end items starts.
4. Contracts are for dismantling, demolition, or removal of improvements.

(b) When it is determined that a performance bond is required, the Contractor shall be required to obtain performance bonds as follows:

1. The penal amount of performance bonds shall be 100 percent of the original contract price, unless the (Recipient) determines that a lesser amount would be adequate for the protection of the (Recipient).
2. The (Recipient) may require additional performance bond protection when a contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price.

The (Recipient) may secure additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) A payment bond is required only when a performance bond is required, and if the use of payment bond is in the (Recipient's) interest.

(d) When it is determined that a payment bond is required, the Contractor shall be required to obtain payment bonds as follows:

1. The penal amount of payment bonds shall equal:
 - (i) Fifty percent of the contract price if the contract price is not more than \$1 million;
 - (ii) Forty percent of the contract price if the contract price is more than \$1 million but not more than \$5 million; or
 - (iii) Two and one half million if the contract price is increased.

Advance Payment Bonding Requirements

The Contractor may be required to obtain an advance payment bond if the contract contains an advance payment provision and a performance bond is not furnished. The (recipient) shall determine the amount of the advance payment bond necessary to protect the (Recipient).

Patent Infringement Bonding Requirements (Patent Indemnity)

The Contractor may be required to obtain a patent indemnity bond if a performance bond is not furnished and the financial responsibility of the Contractor is unknown or doubtful.

The (recipient) shall determine the amount of the patent indemnity to protect the (Recipient).

Warranty of the Work and Maintenance Bonds

1. The Contractor warrants to (Recipient), the Architect and/or Engineer that all materials and equipment furnished under this Contract will be of highest quality and new unless otherwise specified by (Recipient), free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards shall be considered defective. If required by the [Project Manager], the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

2. The Work furnished must be of first quality and the workmanship must be the best obtainable in the various trades. The Work must be of safe, substantial and durable construction in all respects. The Contractor hereby guarantees the Work against defective materials or faulty workmanship for a minimum period of one (1) year after Final Payment by (Recipient) and shall replace or repair any defective materials or equipment or faulty workmanship during the period of the guarantee at no cost to (Recipient). As additional security for these guarantees, the Contractor shall, prior to the release of Final Payment [as provided in Item X below], furnish separate Maintenance (or Guarantee) Bonds in form acceptable to (Recipient) written by the same corporate surety that provides the Performance Bond and Labor and Material Payment Bond for this Contract. These bonds shall secure the Contractor's obligation to replace or repair defective materials and faulty workmanship for a minimum period of one (1) year after Final Payment and shall be written in an amount equal to ONE HUNDRED PERCENT (100%) of the CONTRACT SUM, as adjusted (if at all).

Seismic Safety—Contractor agrees that any new building or addition to an existing building shall be designed and constructed in accordance with the standards required in USDOT Seismic Safety Regulations 49 CFR 41 and shall certify compliance to the extent required by the regulation. Contractor shall also ensure that all work performed under this contract, including work performed by subcontractors, complies with the standards required by 49 CFR 41 and the certification of compliance issued on the project.

Disadvantaged Business Enterprises --

a. This contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs. The national goal for participation of Disadvantaged Business Enterprises (DBE) is 10%. The recipient's overall goal for DBE participation is 5%. A 5% contract goal for DBE participation has been established for this procurement.

b.) The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this contract. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the municipal corporation deems appropriate. Each subcontract the contractor signs with a subcontractor must include the assurance in this paragraph (see 49 CFR 26.13(b)).

c.) If a separate contract goal has been established, Bidders/offerors are required to document sufficient DBE participation to meet these goals or, alternatively, document adequate good faith efforts to do so, as provided for in 49 CFR 26.53.

d.) If no separate contract goal has been established, the successful bidder/offeror will be required to report its DBE participation obtained through race-neutral means throughout the period of performance.

e.) The contractor is required to pay its subcontractors performing work related to this contract for satisfactory performance of that work no later than 30 days after the contractor's receipt of payment for that work from the recipient. In addition, the contractor may not hold retainage from its subcontractors or must return any retainage payments to those subcontractors within 30 days after the subcontractor's work related to this contract is satisfactorily completed or must return any retainage payments to those subcontractors within 30 days after incremental acceptance of the subcontractor's work by the recipient and contractor's receipt of the partial retainage payment related to the subcontractor's work.

f.) The contractor must promptly notify the recipient whenever a DBE subcontractor performing work related to this contract is terminated or fails to complete its work, and must make good faith efforts to engage another DBE subcontractor to perform at least the same amount of work. The contractor may not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of the recipient.

Prompt Payment –

The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contract receives from the Recipient. The prime contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractors work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Recipient. This clause applies to both DBE and non-DBE subcontracts.

Recycled Products –The contractor agrees to comply with all the requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.

Incorporation of Federal Transit Administration (FTA) Terms –

The preceding provisions include, in part, certain Standard Terms & Conditions required by USDOT, whether or not expressly stated in the preceding contract provisions. All USDOT-required contractual provisions, as stated in FTA Circular 4220.1F, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The contractor shall not perform any act, fail to perform any act, or refuse to comply with any request that would cause the recipient to be in violation of FTA terms and conditions.

Drug & Alcohol Abuse and Testing –

The Contractor agrees to comply with the following Federal substance abuse regulations: a. Drug-Free Workplace. U.S. DOT regulations, "Drug-Free Workplace Requirements (Grants)," 49 C.F.R. Part 32, that implements the Drug-Free Workplace Act of 1988 as amended, 41 U.S.C. §§ 8103 et seq., and 2 CFR part 182, b. Alcohol Misuse and Prohibited Drug Use. FTA Regulations, "Prevention of Alcohol Misuse and Prohibited Drug Use in Transit Operations," 49 USC 5331, as amended by Map-21, 49 CFR part 40, 49 USC chapter 53, 49 CFR Part 655, to the extent applicable.

Other Federal Requirements:

Conformance with ITS National Architecture – Contractor shall conform, to the extent applicable, to the National Intelligent Transportation Standards architecture as required by SAFETEA-LU Section 5307(c), 23 U.S.C. Section 512 note and follow the provisions of FTA Notice, "FTA National Architecture Policy on Transit Projects," 66 Fed. Reg. 1455 et seq., January 8, 2001, and any other implementing directives FTA may issue at a later date, except to the extent FTA determines otherwise in writing.

Access Requirements for Persons with Disabilities – Contractor shall comply with 49 USC 5301(d), stating Federal policy that the elderly and persons with disabilities have the same rights as other persons to use mass transportation services and facilities and that special efforts shall be made in planning and designing those services and facilities to implement that policy. Contractor shall also comply with all applicable requirements of Sec. 504 of the Rehabilitation Act (1973), as amended, 29 USC 794, which prohibits discrimination on the basis of handicaps, and the Americans with Disabilities Act of 1990 (ADA), as amended, 42 USC 12101 et seq., which requires that accessible facilities and services be made available to persons with disabilities, including any subsequent amendments thereto.

Contracts Involving Federal Privacy Act Requirements - The following requirements apply to the Contractor and its employees that administer any system of records on behalf of the Federal Government under any contract:

(1) The Contractor agrees to comply with, and assures the compliance of its employees with, the information restrictions and other applicable requirements of the Privacy Act of 1974, 5 U.S.C. § 552a. Among other things, the Contractor agrees to obtain the express consent of the Federal Government before the Contractor or its employees operate a system of records on behalf of the Federal Government. The Contractor understands that the requirements of the Privacy Act, including the civil and criminal penalties for violation of that Act, apply to those individuals involved, and that failure to comply with the terms of the Privacy Act may result in termination of the underlying contract.

(2) The Contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

Ineligible Contractors and Subcontractors - Any name appearing upon the Comptroller General's list of ineligible contractors for federally-assisted contracts shall be ineligible to act as a subcontractor for contractor pursuant to this contract. If contractor is on the Comptroller General's list of ineligible contractors for federally

financed or assisted construction, the recipient shall cancel, terminate or suspend this contract.

Compliance With Federal Regulations - Any contract entered pursuant to this solicitation shall contain the following provisions: All USDOT-required contractual provisions, as set forth in FTA Circular 4220.1F, are incorporated by reference. Anything to the contrary herein notwithstanding, FTA mandated terms shall control in the event of a conflict with other provisions contained in this Agreement. Contractor shall not perform any act, fail to perform any act, or refuse to comply with any grantee request that would cause the recipient to be in violation of FTA terms and conditions. Contractor shall comply with all applicable FTA regulations, policies, procedures and directives, including, without limitation, those listed directly or incorporated by reference in the Master Agreement between the recipient and FTA, as may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

**EXHIBIT B
STATE OF CONNECTICUT
GRANT REQUIREMENTS**

STATE OF CONNECTICUT GRANT REQUIREMENTS

Small Business Enterprises. In connection with the performance of this Agreement, the Consultant shall cooperate with the District in meeting its commitments and goals with regard to the maximum utilization of small business enterprises ("SBEs"), as defined in Section 4a-60 of the Connecticut General Statutes, and will use its best efforts to insure that SBEs shall have the maximum practicable opportunity to compete for any sub-contract work under this Agreement.

The District has agreed with the Connecticut Department of Transportation to include in the Agreement the Special Provisions Requirements of Section 46a-68j-30(9) of the Contract Compliance Regulations.

The Contractor agrees to ensure that small business enterprises as defined in Section 4a-60 of the Connecticut General Statutes have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with State funds provided under this agreement. In this regard all recipients or contractors shall take necessary and reasonable steps in accordance with Section 4a-60 of the Connecticut General Statutes to ensure that small business enterprises have the maximum opportunity to compete and perform contracts. Recipients and their contractors shall not discriminate on the basis of race, creed, color, national origin, age or sex in the award of federal assisted contracts.

Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient (the District) deems appropriate.

Non-Discrimination in Employment and Affirmative Action. In connection with the carrying out of the Project the Consultant shall not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Consultant shall take affirmative action to ensure that applicants are employed, and that employees are treated during their pre-employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff, or termination; rates of pay, or other forms of compensation; and selection for training, including apprenticeship. The provisions of Executive Order No. 11246 of September 21, 1965, as amended, and all rules, regulations and orders of the Federal government issued pursuant thereto are incorporated herein by reference and made a part hereof. The Consultant agrees to comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. §2000d-4) and all requirements imposed by Title 49 C.F.R. part 21 and other pertinent directives of the federal government to the end that no person shall on the grounds of race, color, sex or national origin be excluded from participation in, or be denied the benefits of, or be otherwise subjected to discrimination under the Project.

The District has agreed with the Connecticut Department of Transportation ("CTDOT") to include in this Agreement the following Sections from the Agreement between the District and CTDOT:

Section 32 Civil Rights. (b)(1) The Second Party (the "District and its Operator") agrees and warrants that in the performance of the contract such Second Party will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation or physical disability, including, but not limited to, blindness, unless shown by such Second Party that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut. The Second Party further agrees to take affirmative action to insure that applicants with job related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, mental retardation, or physical disability, including, but not limited to, blindness, unless shown by such Second Party that such disability prevents performance of the work involved; (2) the Second Party agrees, in all solicitations or advertisements for employees placed by or on behalf of the Second Party, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission (on Human Rights and Opportunities of the State of Connecticut); (3) the Second Party agrees to provide each labor union or representative of workers with which such Second Party has a collective bargaining agreement or other contract or understanding and each vendor with which such Second Party has a contract or understanding, a notice to be provided by the Commission advising the labor union or workers' representative of the Second Party's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Second Party agrees to comply with each provision of this section and Conn. Gen. Stat. §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Conn. Gen. Stat. §§ 46a-56, 46a-68e, and 46a-68f; (5) the Second Party agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Second Party as they relate to the provisions of this section and § 46a-56.

Section 33. Nondiscrimination (Sexual Orientation). (a) Pursuant to § 4a.60 of the Connecticut General Statutes, (1) the Second Party agrees and warrants that in the performance of the contract such Second Party will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Second Party agrees to provide each labor union or representative of workers with which such Second Party has a collective bargaining agreement or other contract or understanding and each vendor with which such Second Party has a contract or understanding, a notice to be provided by the Commission advising the labor union or workers' representative of the Second Party's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Second Party agrees to comply

with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to § 46a-56 of the general statutes; (4) the Second Party agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Second Party as they relate to the provisions of this section and § 46a-56.

Non-Discrimination on the Basis of Disability. The Consultant shall insure that all fixed facility construction or alteration and all new equipment purchased to provide the Services comply with applicable regulations regarding Non-Discrimination on the Basis of Handicap in Programs and Activities Receiving or Benefitting from Federal Financial Assistance, set forth at Title 49, Code of Federal Regulations, Part 27, and any amendments thereto.

The Agreement shall be deemed to include the CONNECTICUT REQUIRED CONTRACT/AGREEMENT PROVISIONS including but not limited to Equal Employment Opportunity Responsibilities, Policy on SBEs, and Code of Ethics, incorporated herein by reference, and all requirements upon consultants and contractors of the "Second Party" (the "District") set forth in said PROVISIONS shall be deemed requirements upon the Consultant hereunder. In any event, the Consultant shall do nothing which would cause the District to be in violation of the requirements upon it, as the "Second Party" under said PROVISIONS.

EXHIBIT C
PROCUREMENT AND APPEALS PROCESS

GHTD PROCUREMENT PROCEDURES AND APPEALS PROCESS

It is the policy of the Greater Hartford Transit District that it is responsible for resolving all Pre-Bid, Pre-Award and Post-Award Procurement Protest disputes arising out of third party procurements using good administrative practices and sound business judgment. It is the District's intention that its procurement process provides for fair and open competition in compliance with federal and state laws and District Policies.

The District has established these pre-bid, pre-award, and post-award procurement protest policy and procedures so that all procurement protests/disputes are filed, processed and resolved in a manner consistent with the requirements of the Federal Transit Administration.

1. Pre-Bid

A pre-bid or solicitation phase protest is received prior to the bid opening or proposal due date. Pre-bid protests are those based on the content of the initial notice and/or solicitation published by the District requesting bids or proposals from vendors or other interested parties.

2. Pre-award

A pre-award protest is a protest against making an award and is received after receipt of proposals or bids, but before award of a contract.

3. Post-Award

A post-award protest is a protest received after award of a contract. A post-award protest must be received within 5 business days of the notification of the award. A post-award protest generally alleges a violation of applicable federal or state law and/or District policy or procedures relative to the seeking, evaluating and/or awarding of the contract. Each Proposer will be notified by first class mail of the decision of the District as to the selection of firm under this procurement. Included in that notification will be a proposed effective date of engagement which will be no less than 15 days following the date of notification of award.

It is the policy of the District not to proceed with the award phase of any procurement if there is a pending protest.

All Protests must be filed in writing to:

Vicki L. Shotland, Executive Director
Greater Hartford Transit District
One Union Place
Hartford, CT 06103

A Protest must be in writing and set forth the specific grounds of the dispute and shall be fully supported with technical data, test results, or other pertinent information related to the subject being protested. The Protest shall include the name and contact information of the Protester, solicitation number or description, and what remedy the Protester is seeking. The Protester is responsible for adhering to this regulation

Greater Hartford Transit District, Vicki L. Shotland, Executive Director or designee shall make a determination on the Protest generally within ten (10) working days from receipt of the Protest. The Decision of the Executive Director or Designee must be in writing and shall

include a response to each substantive issue raised in the Protest. The Executive Director's decision shall constitute the District's final administrative determination.

If the District postpones the date of Bid submission because of a Protest or Appeal of the solicitation specifications, addenda, dates or any other issue relating to the procurement, the District will notify, via addendum, all parties who are on record as having obtained a copy of the solicitation documents that a Protest/Appeal has been filed and the due date for Bid submission shall be postponed until the District has issued its final decision.

The Protester may withdraw its Protest or Appeal at any time before a final decision is issued.

A Protester must exhaust all administrative remedies with the District before pursuing a protest with the Federal Transit Administration (FTA). Reviews of protests by the FTA will be limited to (1) failure to have or to follow the District's protest procedures or failure to review a complaint or Protest or (2) violations of Federal law or regulation.

A Protest Appeal to FTA must be received within five (5) working days of the date of the final decision by the Greater Hartford Transit District is rendered. The appeal must be in writing and must include the name and address of the protestor, cite the District as the grantee, the number of the solicitation, a statement of the grounds for protest and any supporting documentation, including a copy of the local Protest filed with the District and a copy of the District's decision, if any. Protest appeals should be filed with:

Federal Transit Administration Region 1 Office,
Kendall Square
Attention: Procurement Appeal
55 Broadway, Suite 920
Cambridge, MA 02142-1093

Upon receipt of a notice that an appeal has been submitted to FTA prior to the award of a contract, the District will immediately contact the appropriate FTA official to determine if the Response Date should be postponed. If the Response Date is postponed, the District will contact all Proposers or firms who have been furnished a copy of the RFP that an appeal has been filed and that the Response Date is postponed until FTA has issued its decision. Appropriate addenda will be issued rescheduling the Response Date.

Any appeal to FTA may be withdrawn at any time before FTA has issued its decision.

FTA's decision on any appeal will be final. No further appeals will be considered by FTA.

**EXHIBIT D
BID PROPOSAL FORM**

BID PROPOSAL FORM

APPLICABILITY: This section applies to all work related to the IFB/contract.

RELATED DOCUMENTS: Addenda and general provisions of the Contract.

SUMMARY: This Section specifies the form of the Contractor's submittal

PROJECT IDENTIFICATION: GHTD #02-021 Roofing Repair / Replacement

SUBMISSION PROVIDED TO THE OWNER:

LaShaunda Drake
Procurement and Contract Coordinator
Greater Hartford Transit District
One Union Place
Hartford, CT 06103

Company Name (Please print or type)

Address (Street, city, state, zip)

Phone Number

Fax Number

Submitted by: _____ Date: _____
Name & Title (Print or type)

Authorized Signature:

I certify that I am an official of _____ and have the authority to execute this Bid Proposal. The undersigned hereby agrees to furnish the equipment and materials as listed below in accordance with the terms, conditions and specifications contained _____ in GHTD 02-021. The undersigned agrees to provide construction services at One Union Place in Hartford.

The following attachments shall be provided with all bids. Failure to provide the requested information may be considered material and be cause for rejection:

- A document listing exceptions to and/or variations from the conditions and specifications, if any.
- Warranties, as requested.
- Statement of Bidder's Qualifications.
- Project Manager/Superintendent Resume and Qualifications.
- Executed certifications.
The Undersigned understands and acknowledges that the failure to comply with the requirements of these certifications constitutes a non-responsive bid, and thereby, invalidates this entire bid proposal.
- Hourly rates for individuals involved in activities.
- Bid Bond Documentation.
- Schedule of Values
- List of Subcontractors

SUBMISSION – BASE BID: The base bid shall include the lump-sum costs, plus estimated work item quantities multiplied by unit prices, as identified below.

1. Project Mobilization shall include General Contractor and subcontractor mobilization costs. Include permits, temporary offices, etc. Provide itemized breakdown, if requested.
2. Project general requirements and all miscellaneous costs associated with completion of work in accordance with the construction documents. This shall include, but not be limited to, shoring, barricades, cleanup, dust and fume control, layout, equipment, waste disposal, documentation, and obstruction removal and replacement.
3. Contract lump-sum prices and unit prices shall include all costs to provide, install, and/or repair work items, including, but not limited to, labor, materials, equipment, shipping/transportation, supervision, overhead, and profits. Quantities shown are estimated, and the actual work quantities may be greater or fewer than these quantities. The Bid unit price shall remain firm regardless of variations between the estimated and actual quantities. The quantities appearing in schedules in the contract documents are approximate only and are prepared for comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted in accordance with the contract unit prices. The Greater Harford Transit District reserves the right to delete any item, portion, or phase of the work. Bid price for all other work items to remain unchanged.
4. Schedule of work items, quantities, and prices comprising the base bid.

Description – ROOFS : CT1, LS1, LS2	Quantity	Unit Price	Bid Price
1. Project Mobilization associated with Roofs CT1, LS1, LS2 (Note that the work will be phased and will be performed over two separate phases with two separate mobilizations)	Lump Sum	-	\$ _____
2. All work included in Specification Section 035300 – Concrete Topping, except unit price work indicated below.	Lump Sum	-	\$ _____
2a. Roof LS1: Remove delaminated, spalled, and damaged areas of lightweight concrete topping and replace with new lightweight concrete topping	20 SQ FT	\$ _____	\$ _____
3. All work included in Specification Section 061000 – Rough Carpentry, except unit price work indicated below	Lump Sum	-	\$ _____
3a. Roof CT1: Remove and replace deteriorated plywood roof sheathing and roof insulation	80 SQ FT	\$ _____	\$ _____
4. All work included in Specification Section 061500 – Wood Deck Boards and Soffit, except unit price work indicated below			
5. The following unit-price work included in Specification Section 061500 – Wood Deck Boards and Soffit	-	-	-
5a. Roof LS2: Remove and replace deteriorated roof deck boards	20 SQ FT	\$ _____	\$ _____
6. All work included in Specification Section 073213 – Clay Tile Roofing, except unit price work indicated below:	Lump Sum	-	\$ _____

Description – ROOFS : CT1, LS1, LS2	Quantity	Unit Price	Bid Price
6a. Roof CT1: Remove and replace individual loose, missing, or damaged clay roof tiles in the field of the roof (not including roof tiles damaged from removal).	60 EA	\$ _____	\$ _____
7. All work included in Specification Section 075419 – PVC Roofing (not including work at Roof LS3)	Lump Sum	-	\$ _____
8. All work included in Specification Section 076000 – Sheet Metal Flashing, except unit price work indicated below (not including work at Roofs AS1, AS3, and LS3)	Lump Sum	-	\$ _____
8a. Roof CT1: Repair cracked solder joints in the existing copper gutters to remain by removing the existing solder and re-soldering	10 LF	\$ _____	\$ _____
8b. Roof CT1: Repair holes in the existing copper gutters to remain by soldering a copper patch over the existing hole or tear	5 EA	\$ _____	\$ _____
9. All work included in Specification Section 079200 – Joint Sealant (not including work at Roofs AS1, AS2, and LS3)	Lump Sum	-	\$ _____
10. General conditions and all other work included in the Contract Documents, not listed above, associated with Roofs CT1, LS1, and LS2.	Lump Sum	-	\$ _____
ROOFS CT1, LS1, LS2 TOTAL			\$ _____

The undersigned hereby proposes to provide all work, labor and materials indicated in the IFB Documents for the above referenced project for the amount of:

TOTAL BASE BID:

_____ \$ _____
 Written out here Numbers here*

*Note: In case of conflict, the written out amount shall govern

Note: Material markup over Contractor's cost for all material utilized for extra work authorized under the terms of this Contract (percentage shall include any applicable tax Contractor must charge) is limited to 10%.

BID – ALTERNATES: The undersigned hereby proposes to provide all work, labor and materials indicated in the IFB Document for the following Alternates for the amounts indicated:

Description – Add Alternate #AS1	Quantity	Unit Price	Bid Price
1. Project Mobilization Associated with Roof AS1	Lump Sum	-	\$ _____
2. All work included in Specification Section 061000 – Rough Carpentry associated with Roof AS1	Lump Sum	-	\$ _____
3. The following unit-price work included Specification Section 061500 – Wood Deck Boards and Soffit	-	-	-
3a. Roof AS1: Remove and replace deteriorated roof deck boards	20 SQ FT	\$ _____	\$ _____
3b. Roof AS1: Remove and replace deteriorated wood soffit boards	80 LF	\$ _____	\$ _____
3c. Roof AS1: Reattach existing sound, loose soffit boards	10 EA	\$ _____	\$ _____
4. All work included in Specification Section 073113 – Asphalt Shingles associated with Roof AS1	Lump Sum	-	\$ _____
5. All work included in Specification Section 076000 – Sheet Metal Flashing, associated with Roof AS1	Lump Sum	-	\$ _____
6. All work included in Specification Section 079200 – Joint Sealant associated with Roof AS1	Lump Sum	-	\$ _____
7. General conditions and all other work included in the Contract Documents, not listed above, associated with Roof AS1.	Lump Sum	-	\$ _____
ADD ALTERNATE #AS1 TOTAL			\$ _____

Description – Add Alternate #AS3	Quantity	Unit Price	Bid Price
1. Project Mobilization Associated with Roof AS3	Lump Sum	-	\$ _____
2. All work included in Specification Section 010290 – Bird Netting.	Lump Sum	-	\$ _____
3. All work included in Specification Section 061000 – Rough Carpentry associated with Roof AS3.	Lump Sum	-	\$ _____
4. The following unit-price work included Specification Section 061500 – Wood Deck Boards and Soffit.	-	-	-
4a. Roof AS3: Remove and replace deteriorated roof deck boards.	20 SQ FT	\$ _____	\$ _____
4b. Roof AS3: Remove and replace deteriorated wood soffit boards.	360 LF	\$ _____	\$ _____
4c. Roof AS3: Reattach existing sound, loose soffit boards.	20 EA	\$ _____	\$ _____
5. All work included in Specification Section 070150 – Asbestos-Containing Roofing Removal.	Lump Sum	-	\$ _____
6. All work included in Specification Section 073113 – Asphalt Shingles associated with Roof AS3.	Lump Sum	-	\$ _____
7. All work included in Specification Section 076000 – Sheet Metal Flashing, associated with Roof AS3.	Lump Sum	-	\$ _____
8. All work included in Specification Section 079200 – Joint Sealant associated with Roof AS3.	Lump Sum	-	\$ _____
9. General conditions and all other work included in the Contract Documents, not listed above, associated with Roof AS3.	Lump Sum	-	\$ _____
ADD ALTERNATE #AS3 TOTAL			\$ _____

Description – Add Alternate #LS2	Quantity	Unit Price	Bid Price
1. Credit for all work included in Specification Section 075419 – PVC Roofing associated with Roof LS2	Lump Sum	-	\$ _____
2. Credit for all work included in Specification Section 076000 – Sheet Metal Flashing associated with Roof LS2	Lump Sum	-	\$ _____
3. All work included in Specification Section 076100 – Copper Roofing	Lump Sum	-	\$ _____
4. General conditions and all other work included in the Contract Documents, not listed above, associated with Copper Roofing at Roof LS2.	Lump Sum	-	\$ _____
ADD ALTERNATE #LS2 TOTAL			\$ _____

Description – Add Alternate #LS3	Quantity	Unit Price	Bid Price
1. Project Mobilization Associated with Roof LS3.	Lump Sum	-	\$ _____
2. All work included in Specification Section 061000 – Rough Carpentry associated with Roof LS3.	Lump Sum	-	\$ _____
3. All work included in Specification Section 075419 – PVC Roofing associated with Roof LS3.	Lump Sum	-	\$ _____
4. All work included in Specification Section 076000 – Sheet Metal Flashing associated with Roof LS3.	Lump Sum	-	\$ _____
5. All work included in Specification Section 079200 – Joint Sealant associated with Roof LS3.	Lump Sum	-	\$ _____
6. General conditions and all other work included in the Contract Documents, not listed above, associated with Roof LS3.	Lump Sum	-	\$ _____
ADD ALTERNATE #LS3 TOTAL			\$ _____

ADDENDA: The undersigned acknowledges receipt of the following:

Addendum No. _____

Addendum No. _____

Addendum No. _____

CONTRACT TIME: The undersigned proposes the following Contract dates. Dates incorporated into the Owner-Contractor Purchase Order/Agreement shall govern the Contract and supersede these proposed dates.

Proposed Commencement Date: _____

Proposed Substantial Completion Date: _____

Proposed Final Completion Date: _____

SUPERINTENDENT: The undersigned acknowledges, including with this bid, a complete resume and listing of qualifications of the Project Manager/Superintendent the bidder intends to assign to this project throughout the duration of the Contract.

SUBMISSION BREAKDOWN AND LIST OF SUBCONTRACTORS:
(Note: This can be an attachment to the Bid Proposal)

The base bid proposal is broken down as follows:

Provide Schedule of Values.

List of Subcontractors: The Subcontractors listed are proposed to be used by the bidder. Prior to the execution of the Contract, The Greater Hartford Transit District reserves the right to reject any Subcontractor and require substitution of any Subcontractor with another Subcontractor acceptable to the District.

Work Item/Task	Value	Proposed Subcontractor

EXHIBIT E
REQUIRED FORMS AND CERTIFICATES

AFFIDAVIT

STATE OF CONNECTICUT)
) ss. _____, 20__
COUNTY OF _____)

I, _____, being duly sworn, depose and say:
(insert name of authorized agent)

1. I am the _____ of _____ (the
(insert title) (insert name of company)
"Respondent") and am authorized on behalf of the Proposer to make this Affidavit.
2. I am over 18 years of age and understand the obligations of an oath.
3. There are no delinquent real and personal property taxes due the State of Connecticut from the Respondent.
4. The Respondent is current on all monetary obligations due the State of Connecticut.
5. The Respondent is currently in compliance with all applicable laws, regulations and ordinances of the United States and, State of Connecticut.

(Insert name of company)

By:

Name: Title:

Subscribed and sworn to before me, _____, the undersigned officer this

_____ day of _____, 20__.

Notary Public

My Commission Expires:

CERTIFICATION OF ELIGIBILITY

_____ hereby certifies that neither
(Name of Proposer)
it nor its "principals" is included on the U.S. Comptroller General's Debarred Bidders List.

Signature: _____

Firm: _____

The Proposer certifies to the best of its knowledge and belief that it and its principals

- A. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this transaction by any Federal department or agency.
- B. Have not, within a three-year period preceding the date of this Proposal, been convicted of or had a civil judgment rendered against it for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction, violation of Federal or State anti-trust statues or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statement, or receiving stolen property.
- C. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in Paragraph B of this Certification.
- D. Have not, within a three-year period preceding the date of this Proposal, had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the Proposer is unable to certify to any of the statements in this certification, such Proposer shall include an explanation in such regard with its Proposal.

THE UNDERSIGNED CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.

(Check One)

_____ I DO CERTIFY

_____ I DO NOT CERTIFY

DATE: _____

SIGNATURE: _____

TITLE: _____

CERTIFICATION OF NON-COLLUSION

The Undersigned certifies, under penalties of perjury:

That this Proposal has been made by the Proposer independently, and has been submitted without collusion, and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment, or services described in this procurement document, designed to limit independent bidding or competition;

That the contents of the proposal have not been communicated by the Proposer or its employees or agents to any person not an employee or agent of the Proposer or its surety or any bond furnished with the proposal, and will not be communicated to any such person prior to the official awarding of this procurement.

That I have fully informed myself regarding the accuracy of the statement made in the certificate.

SIGNATURE: _____

NAME: _____

FIRM: _____

TITLE: _____

DATE: _____

CERTIFICATION OF RESTRICTIONS ON LOBBYING

I, _____, of _____,
Name & Title Name of Firm

hereby certify that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form, "Disclosure Form to Report Lobbying," in accordance with its instruction as amended.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements), and that all subrecipients shall certify and disclose accordingly.
4. The undersigned acknowledges that this certification is a material representation of fact, upon which reliance is placed at the time that the transaction concerned herewith was made or entered into, and that submission of this certification is a prerequisite for making or entering into such transaction imposed by Section 1352, Title 31, U.S. Code as amended. Any person who fails to file the required certification shall be subject to civil penalty of not less than \$10,000, and not more than \$100,000 for each such failure.
5. The undersigned certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the undersigned understands and agrees that the provisions of 31 US Code A3801, et seq., apply to this certification and disclosure, if any.

Executed this _____ day of _____, 20_____.

By: _____
Signature & Title of Authorized Official

CONTRACTOR'S STATEMENT ON SUB-CONTRACTORS

1. There are NO sub-Contractors associated with this proposal.

Authorized Signee: _____

Printed Name: _____

Title: Date: _____

For (Company): _____

OR

2. Listed below are sub-Contractors associated with this proposal. Additional sheets are attached as required. I _____ have also attached appropriate Disadvantage Business Certifications.

Name of Company: _____

Address: _____

Contact Person: _____

Telephone #: _____

E-mail: _____

Name of Company: _____

Address: _____

Contact Person: _____

Telephone #: _____

E-mail: _____

CERTIFICATION FOR DISADVANTAGED BUSINESS ENTERPRISE

It is the policy of the U.S. Department of Transportation that disadvantaged business enterprises as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with State and/or Federal funds under this agreement.

The supplier or Contractor agrees to ensure that disadvantaged business enterprises as defined above have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this agreement. In this regard all recipients or contractors shall take necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged business enterprises have the maximum opportunity to compete and perform contracts. Recipients and their contractors shall not discriminate on the basis of race, creed, color, national origin, age or sex in the award of federal assisted contracts.

The specific goal for this project is a minimum of **5%**.

Contractor will meet the DBE goal for this contract. Proposer is certified according to requirements of DOT 49 CFR Part 26 as a DBE eligible for participation in DOT assisted contracts, and will be performing _____ percent (_____ %) of the contract work.

Contractor will meet the DBE goal for this contract. If awarded this contract, proposer will subcontract with the DBE(s) listed below which will be performing a total of _____ percent (_____%) of the total dollar amount of contract work. Each DBE listed below is certified according to requirements of DOT 49 CFR Part 26 for participation in DOT assisted contracts.

DBE Name and Address	Description of Work	Percent of Dollar Amount of Total Contract Work
----------------------	---------------------	---

_____	_____	_____
_____	_____	_____
_____	_____	_____

(Attach additional sheets)

Contractor (if unable to meet the DBE goal of 5%) is committed to a minimum of ___% DBE utilization on this contract and will submit documentation demonstrating good faint efforts using the attached form.

SIGNATURE: _____

NAME: _____

FIRM: _____

TITLE: _____

DATE: _____

Any contractor and/or sub-contractor utilized to meet the DBE Participation requirements must be certified through the State of Connecticut Department of Transportation's Unified Certification Program (UCP).

DBE GOOD FAITH EFFORTS DOCUMENTATION FORM
ANNUAL DBE GOAL: 5%

If Contractor has indicated on the DBE Participation Form that it does not meet the DBE goal, proposer must submit this form with its DBE Participation Form as documentation of its good faith efforts to meet the goal. Failure to submit this form with its proposer may render this proposal non-responsive. The Greater Hartford Transit District may require that proposer provide additional substantiation of good faith efforts.

Date: _____ Area of Expertise: _____
Name: _____ Company Name: _____
Response: _____

Date: _____ Area of Expertise: _____
Name: _____ Company Name: _____
Response: _____

Date: _____ Area of Expertise: _____
Name: _____ Company Name: _____
Response: _____

Date: _____ Area of Expertise: _____
Name: _____ Company Name: _____
Response: _____

Date: _____ Area of Expertise: _____
Name: _____ Company Name: _____
Response: _____

DBE LETTER OF INTENT
(a separate form is to be submitted for each DBE firm)

Name of bidder/offeror's firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Name of DBE firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____

Description of work to be performed by DBE firm:

The bidder/offeror is committed to utilizing the above-named DBE firm for the work described above. The estimated dollar value of this work is \$ _____.

Affirmation

The above-named DBE firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above and that the firm is DBE certified to perform the specific trades.

By _____ Date: _____
(Signature)

(Title)

If the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.

BUY AMERICA CERTIFICATION

The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 C.F.R. Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver.

Certification requirement for procurement of steel, iron, or manufactured products.

Certificate of Compliance with 49 U.S.C. 5323(j)(1)

The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 C.F.R. Part 661.5.

Date _____

Signature _____

Company Name _____

Title _____

Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(1) and 49 C.F.R. 661.5, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Date _____

Signature _____

Company Name _____

Title _____

APPROVED EQUAL FORM

Bidder/ Equipment Manufacturer

IFB Equipment _____ Section Number _____ Section Title _____

Bidder's Request:

The District's Response:

Approved:

Denied:

Noted:

See Addendum:

Comments:

Procurement Officer: _____ Date: _____

STATEMENT OF BIDDER'S QUALIFICATIONS

(To be submitted by the Bidder with the Bid)

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

1. Name of Bidder: _____

2. Bidder's Tax Identification Number: _____

3. Permanent Main Office Address: _____

4. When Organized: _____

5. Organizational structure of business entity (select one):

_____ General partnership (GP)

_____ Limited partnership (LP)

_____ Limited liability corporation (LLC)

_____ Limited liability partnership (LLP)

_____ Corporation

_____ Individual doing business under a trade name (sole proprietor)

_____ Other (specify)

6. If a Corporation, Where Incorporated: _____

7. How many years have you been engaged in construction under your present firm or trade name: _____

8. Contracts on hand: (Schedule these, showing gross amount of each Contract and the appropriate anticipated dates of completion).

9. General character of work performed by you:

10. Have you ever failed to complete any work awarded to you? If so, where and why:

11. Have you ever defaulted on a Contract? If so, where and why.

12. List up to six past contracts of this type/size your firm has completed within the last three (3) years.

Project	Date	Contact Person	Phone No.

13. List your major equipment available for this Contract.

14. Experience in work similar in importance to this project.

15. Background and experience of the principal members of your organization, including the officers.

16. Give Bank reference.

17. Status of the business and its current standing with the Secretary of State's office:

Connecticut Businesses – Are all required filings current with the Secretary of State be able to issue a Certificate of Legal Existence?	Yes	No
	_____	_____
Out-of-State (Foreign) Businesses – Have you filed a Certificate of Authority / Application of Registration with the Connecticut Secretary of State? If not, submit a copy of your Certificate of Good Standing from your state of incorporation.	Yes	No
	_____	_____

18. Is your local organization an affiliate of a Parent company? If so, indicate the principal place of business of the parent company and the name of agent for service.

Business Name _____

Address _____

City _____ State _____ Zip _____

Name of Agent _____

19. List of Affiliated Businesses (attach additional sheets as necessary):

Business Name	Address	Ownership Interest (%)

20. Based on the organizational structure of your business, provide a current listing of all corporate officers, principals, general or managing partners, limited partners, managers and members. If sole proprietorship or general partnership, attach trade name certificate filed with the town clerk's office.
21. Submit copies of all required business (trade and occupational) licenses with your response.
22. Your company may be asked to submit information relative to your company's financial statements and/or a Dun & Bradstreet report may be obtained prior to receiving an award. This information will be protected to the fullest extent required by law.
23. Additional information/documentation may be requested subsequent to your responding to this solicitation.
24. The undersigned hereby authorizes and requests any persons, firm, or corporation to furnish any information requested by the Greater Hartford Transit District in verification of the recitals comprising this statement of the Bidder's qualifications.

Dated at _____ this _____ day of _____ 20____.

 (Name of Bidder)

By: _____

Title: _____

State of _____)
) SS

County of _____)

_____ being duly sworn,

deposes and says that he/she is

_____ of _____ and that
 he/she answers to the foregoing questions and all statements therein are true and correct.

Subscribed and sworn to before me this _____ day of _____ 20____

 (Notary Public)

My Commission Expires: _____

**EXHIBIT F
STATE OF CONNECTICUT
CONTRACT REQUIREMENTS**

REQUIREMENTS OF THE STATE OF CONNECTICUT

The Agreement between the District and the Connecticut Department of Transportation has specific provisions that are passed on to all third party contractors including, but not limited to, Civil Rights, Nondiscrimination, Affirmative Action/Equal Employment Opportunities, Disadvantaged Business Enterprise, Governors' Executive Orders, Code of Ethics, and all applicable federal regulations. These provisions and all applicable appendices of the Agreement are herein incorporated by reference and made a part of this contract.

Signed:

Authorized Corporate Official

Date

CONNECTICUT REQUIRED CERTIFICATIONS

All contract certifications required by the State of Connecticut must be included with the proposal. The instructions and affidavits forms are available at the State of Connecticut, Office of Policy and Management Internet site at:

<http://www.ct.gov/opm/cwp/view.asp?A=2982&Q=386038>

Gift Certification – Form 1

Certification of State Agency Official or Employee Authorized to Execute Contract – Form 3

Consulting Agreement Affidavit – Form 5

Check this site immediately before you submit your proposal in case of any recent changes to the State's contractual requirements for State contracts for goods and services with a value of \$50,000 or more. It is the responsibility of the proposer to ensure that any and all up-to-date contract certification forms are properly filled out and submitted with your proposal.

SMALL BUSINESS ENTERPRISE (SBE) CERTIFICATION

To be eligible for the State of Connecticut's SBE certification a company must meet the legal definition of a small business or that of a minority owned firm:

SMALL BUSINESS ENTERPRISE (SBE):

Been doing business under the same ownership or management and has maintained its principal place of business in Connecticut for at least one year immediately prior to the date of application; Gross revenues not exceeding \$15,000,000 during its most recent fiscal year; and, 51% ownership held by a person(s) who exercises the operational authority over daily affairs of the business and has the power to direct policies and management and receives beneficial interests of the business.

MINORITY BUSINESS ENTERPRISE (MBE):

A small business (must meet the above-stated SBE criteria) with at least 51% ownership by one or more minority person(s) who exercises operational authority over daily affairs of the business, has the power to direct management and policies, and receives the beneficial interests of the business. A minority is a person(s) who is American Indian, Asian, Black, Hispanic, has origins in the Iberian Peninsula, a woman, or an individual with a disability.

Yes____; My Company is certified by the State of Connecticut as a SBE; attach a copy of the SBE Certification.

No____; My Company is not certified by the State of Connecticut as a SBE.

SBE Certification

The contractor hereby acknowledges that **District** has established a contract goal of **zero percent (0%)** for this project. No further action is required.

Firm Name: _____

Signature: _____

Title: _____

Date: _____

NOTE: This form is to be submitted with the Proposal. Please attach the names and addresses of any and all SBE eligible subcontractors who will perform work on this project, and the approximate dollar amounts to be paid to them. If there is no participation then this must be indicated on the form; the form executed and returned with this Proposal.

EXECUTIVE ORDERS

This Agreement is subject to the provisions of Executive Order No 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms, Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of this agreement as if they had been fully set forth in it. For complete text of said documents, please go to:

<https://portal.ct.gov/Office-of-the-Governor/Governors-Actions/Executive-Orders>

Environmental Law Compliance

The Proposer shall be responsible to comply with all federal and state environmental laws and regulations pertaining to the operation of transit motor buses and/or facilities managed by the Second Party, including but not limited to, pollutants emissions control, storage and/or disposal of waste, fluids, fuels, oil, and chemicals in general. The Second Party shall be responsible to comply with OSHA regulations. The Second Party will hold the State and CTTRANSIT harmless of any lawsuits and/or fines with respect to any environmental and/or OSHA regulations violations.

Publication of Reports

The ownership of all data and material collected under this Agreement shall be vested in the Proposer and the State. All reports shall be submitted to District for review prior to publication. The following statement should appear on the cover or title page of any published report prepared under the terms of this Agreement:

“Prepared in cooperation with the U.S. Department of Transportation (including its participating agencies), Connecticut Department of Transportation and the Greater Hartford Transit District. The opinions, findings and conclusions expressed in this publication are those of the Second Party and do not necessarily reflect the official views or policies of the District, Connecticut Department of Transportation and/or the U.S. Department of Transportation.”

Jurisdiction and Forum Language

This Agreement shall be governed, interpreted and construed under and in accordance with the laws of the State of Connecticut, whether or not its conflict of laws principles would dictate otherwise. This Agreement shall be deemed to have been made in Hartford, Connecticut.

The Proposer irrevocably consents with respect to any claims or remedies at law or in equity, arising out of or in connection with this Agreement to the jurisdiction of the Connecticut Superior Court (except as otherwise required by law or that Agreement), and, with respect to any claim between the Parties, to venue in Judicial District of Hartford-New Britain at Hartford or the United States Federal Court, District of Connecticut, and irrevocably waives any objections that it may have to such jurisdiction on the grounds of lack of personal jurisdiction of such court or the laying of venue of such court or on the basis of forum non convenience or otherwise. Nothing herein shall be construed to waive any of the States or the District’s immunities.

Litigation

The Proposer agrees that the sole and exclusive means for the presentation of any claim against the State arising from or in connection with this Agreement shall be in accordance with Chapter 53 of the Connecticut General Statutes (Claims against the State) and the Proposer further agrees not to initiate legal proceedings in any State or Federal Court in addition to, or in lieu of, said Chapter 53 proceedings.

GHTD IFB #02-021 Roofing Repairs/Replacement
Union Station Transportation Center

Exhibit F

FREEDOM OF INFORMATION ACT

The State is entitled to receive a copy of records and files related to the performance of the Proposer under this Agreement, and such records and files may be subject to the Freedom of Information Act and may be disclosed by the State pursuant to the Freedom of Information Act. No request to inspect or copy such records or files shall be valid unless the request is made to the State in accordance with the Freedom of Information Act. Any complaint by a person who is denied the right to inspect or copy such records or files shall be brought to the Freedom of Information Commission in accordance with the provisions of Sections 1-205 and 1-206 of the Connecticut General Statutes.

RIGHT TO INSPECT RECORDS

By way of its agreement with the Connecticut Department of Transportation, the District agrees to include in all its subcontracts a provision to the effect the subcontractor agrees that the State, the U.S. Department of Transportation and the Comptroller General of the United States or any of their duly authorized representatives, shall, until the expiration of three (3) years after the final payment under the subcontract, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor, involving transactions related to the subcontractor. The term "subcontractor" as used in this clause excludes work not exceeding \$25,000.00.

The period of access and examination described above, for records which relate to (1) appeals for disputes, (2) litigation of the settlement of claims arising out of the performance of this contract, or (3) costs and expenses in relation to the performance of this contract to which exception has been taken by the State, the Comptroller General or any of their duly authorized representatives, shall continue until such appeals, litigation, claims or exceptions have been disposed of.

PROVISIONS DATED MARCH 6, 1998
“SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES”

1. General

- A. Equal employment Opportunity Requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246, Executive Order 11375, the Railroad Revitalization and Regulatory Reform Act of 1976 and other U.S. Department of Transportation nondiscrimination legislation are set forth in this Required Contract/Agreement Provision. The requirements set forth in these special provisions shall constitute the specific affirmative action requirements for project activities under this contract (or agreement) and supplement the equal employment opportunity requirements set forth in other related contract provisions.
- B. “Company” refers to any entity doing business with the Connecticut Department of Transportation and includes but is not limited to the following:
- | | |
|----------------|---|
| Contractors | Vendors (where applicable) |
| Subcontractors | Suppliers of Materials (where applicable) |
| Consultants | Municipalities (where applicable) |
| Subconsultants | Utilities (where applicable) |
- C. The Company will work with the Connecticut Department of Transportation and the federal government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract or agreement.
- E. The Company and all their subcontractors or subconsultants holding subcontracts or subagreements of \$10,000 or more on federally assisted projects and \$5,000 or more on state funded projects, will comply with the following minimum specific requirement activities of equal employment opportunity. The Company will physically include these requirements in every subcontract or subagreement meeting the monetary criteria above with such modification or language as is necessary to make them binding on the subcontractor or subconsultant.
- F. These Required Contract Provisions apply to all state funded and/or federally assisted projects, activities and programs in all facets of the Connecticut Department of Transportation operations resulting in contracts or agreements.

2. Equal Employment Opportunity Policy

The Company will develop, accept and adopt as its operating policy and Affirmative Action Plan utilizing as a guide the Connecticut Department of Transportation Affirmative Action Plan Guideline.

3. Equal Employment Opportunity Officer

The Company will designate and make known to the State Department of Transportation contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and

promoting an active program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

4. Dissemination of Policy

A. All members of the Company's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the Company's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- (1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less than once every six (6) months thereafter, at which time the Company's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable Company Official.
- (2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable Company official covering all major aspects of the Company's equal employment opportunity obligations within thirty (30) days following their reporting for duty with the Company.
- (3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate Company official in the Company's procedures for locating and hiring protected class group employees.

B. In order to make the Company's equal employment opportunity policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the Company will take the following actions:

- (1) Notices and posters setting forth the Company's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
- (2) The Company's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

5. Recruitment

A. When advertising for employees, the Company will include in all advertisements for employees the notation: "An Equal Opportunity Employer". All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

B. The Company will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the Company

will, through its EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the Company for employment consideration.

In the event the Company has a valid bargaining agreement providing for exclusive hiring of all referrals, the Company is expected to observe the provisions of that agreement to the extent that the system permits the Company's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the Company to do the same, such implementation violates Executive Order 11246, as amended.)

- C. The Company will encourage its present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in the areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

6. Personnel Actions

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoffs, and termination, shall be taken without regard to race, color, religion, sex, or national origin, etc. The following procedures shall be followed:

- A. The Company will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- B. The Company will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practice.
- C. The Company will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the Company will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective actions shall include all affected persons.
- D. The Company will promptly investigate all complaints of alleged discrimination made to the Company in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Company will inform every complainant of all of his avenues of appeal.
- E. The general contract provision entitled A(76) Affirmative Action Requirements is made part of this document by reference. In conjunction with this contract provision, only the job categories will change in order to be comparable with the job categories utilized by the Company proposing to do business with the Connecticut Department of Transportation. The goals and timetables will remain the same throughout the contract provision.

7. Training and Promotion

- A. The Company will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

- B. Consistent with the Company's work force requirements and as permissible under Federal and State regulations, the Company shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contact performance. Where feasible, 25 percent of apprentices of trainees in each occupation shall be in their first year of apprenticeship of training. In the event the Training Special Provision is provided under this contract, this subparagraph will be superseded.
- C. The Company will advise employees and applicants for employment of available training programs and entrance requirements for each.
- D. The Company will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. Unions

If the Company relies in whole or in part upon unions as a source of employees, it will use its best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the Company either directly or through an association acting as agent will include the procedures set forth below:

- A. The Company will use its best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- B. The Company will use its best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, or national origin, etc.
- C. The Company is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the Company, the Company shall so certify to the Connecticut Department of Transportation and shall set forth what efforts have been made to obtain such information.
- D. In the event the union is unable to provide the Company with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the Company will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex or national origin, etc. making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that there shall be no excuse that the union with which the Company has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the Company from meeting the obligations pursuant to Executive Order 11246, as amended, and these provisions, such Company shall immediately notify the Connecticut Department of Transportation.

9. Subcontracting

- A. The Company will use its best efforts to solicit Bids from and to utilize minority group subcontractors, or subcontractors with meaningful minority group and female representation among their employees. Companies shall obtain a list of applicable Disadvantaged Business Enterprise firms from the Division of Contract Compliance.
- B. The Company will use its best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.
- C. The General Contract Provisions entitled "Minority Business Enterprises as Subcontractors" is made part of this document by reference and its requirements are applicable to all entities proposing to do business with the Connecticut Department of Transportation.

10. Records and Reports

For the duration of the project, the company will maintain records as are necessary to determine compliance with the Company's equal employment opportunity obligations and Affirmative Action requirements. Additionally, the company will submit all requested reports in the manner required by the contracting agency.

- A. The number of minority and non-minority group members and women employed in each work classification on the project.
- B. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to Companies which rely on whole or in part on unions as a source of their work force).
- C. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and
- D. The progress and efforts being made in securing the services of minority and female owned businesses.
 - (1) All such records must be retained for a period of three (3) years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the State Department of Transportation and the U.S. Department of Transportation including consultant firms.
 - (2) If on-the-job training is being required by the "Training Special Provision", the Company will be required to furnish a Monthly Training Report and Supplement Report (1409) for each trainee.

11. Affirmative Action Plan

- A. Contractors, subcontractors, Vendors, suppliers, and all other Companies with contracts, agreements or purchase orders completely state funded will submit an Affirmative Action Plan if the contract value is \$5,000 or over.
- B. Contractors, subcontractors, Vendors, suppliers, and all other Companies with federally assisted contracts, agreements, or purchase orders valued at \$10,000 or more will submit an Affirmative Action Plan.

- C. Companies with contracts, agreements, or purchase orders with total dollar value under that which is stipulated in A and B above shall be exempt from the required submission of an Affirmative Action Plan unless otherwise directed by the Division of Contract Compliance.

EXHIBIT G
CONNECTICUT DEPARTMENT OF LABOR PREVAILING WAGE BID
PACKAGE

Minimum Rates and Classifications for Building Construction

ID#: 20-14435

**Connecticut Department of Labor
Wage and Workplace Standards Division**

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.

Project Number: IFB #02-021

Project Town: Hartford

State#: IFB #02-021

FAP#: Hartford

Project: Roof Replacement At Union Station Transportation Center (Hartford)

CLASSIFICATION	Hourly Rate	Benefits
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	30.99
2) Boilermaker	38.34	26.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	35.71	33.31 + a
3b) Tile Setter	34.9	25.87
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.7	21.75
3e) Plasterer	33.48	32.06
-----LABORERS-----		
4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	31.0	22.15
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	31.25	22.15

Project: Roof Replacement At Union Station Transportation Center (Hartford)

4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	31.5	22.15
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.	32.0	22.15
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	31.75	22.15
4e) Group 6: Blasters, nuclear and toxic waste removal.	34.0	22.15
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	32.0	22.15
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	29.28	22.15
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	28.74	22.15
4i) Group 10: Traffic Control Signalman	18.0	22.15
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	34.53	25.64
5a) Millwrights	34.94	26.19
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	40.25	29.17+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	55.12	34.765+a+b
-----LINE CONSTRUCTION-----		
Groundman	26.5	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00
8) Glazier (Trade License required: FG-1,2)	39.18	22.55 + a

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9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	37.62 + a
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----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)	42.45	25.30 + a
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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)	42.11	25.30 + a
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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)	41.32	25.30 + a
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Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	40.91	25.30 + a
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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	40.28	25.30 + a
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Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	40.28	25.30 + a
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Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	39.95	25.30 + a
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Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	39.59	25.30 + a
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Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	39.17	25.30 + a
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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).	38.71	25.30 + a
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Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	36.54	25.30 + a
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Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	36.54	25.30 + a
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Project: Roof Replacement At Union Station Transportation Center (Hartford)

Group 12: Wellpoint operator.	36.48	25.30 + a
Group 13: Compressor battery operator.	35.86	25.30 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	34.66	25.30 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	34.23	25.30 + a
Group 16: Maintenance Engineer/Oiler.	33.54	25.30 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	38.11	25.30 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	35.53	25.30 + a
-----PAINTERS (Including Drywall Finishing)-----		
10a) Brush and Roller	35.62	22.55
10b) Taping Only/Drywall Finishing	36.37	22.55
10c) Paperhanger and Red Label	36.12	22.55
10e) Blast and Spray	38.62	22.55
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	44.63	32.95
12) Well Digger, Pile Testing Machine	37.26	24.05 + a
13) Roofer (composition)	38.4	21.35
14) Roofer (slate & tile)	38.9	21.35
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	38.9	39.46
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)	44.63	32.95

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-----TRUCK DRIVERS-----

17a) 2 Axle	29.86	25.79 + a
17b) 3 Axle, 2 Axle Ready Mix	29.97	25.79 + a
17c) 3 Axle Ready Mix	30.03	25.79 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	30.08	25.79 + a
17e) 4 Axle Ready Mix	30.13	25.79 + a
17f) Heavy Duty Trailer (40 Tons and Over)	30.35	25.79 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	30.13	25.79 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	45.92	26.08 + a
19) Theatrical Stage Journeyman	25.76	7.34

Project: Roof Replacement At Union Station Transportation Center (Hartford)

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.

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.

As of: August 3, 2020

Project: Roof Replacement At Union Station Transportation Center (Hartford)

~~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: August 3, 2020

EXHIBIT H

TECHNICAL SPECIFICATIONS AND SPECIAL PROVISIONS

SERVICE DESCRIPTION

a) Purpose

The District is requesting Competitive Sealed Bids from qualified firms for a general contractor interested in contracting with the District to perform roofing repairs and replacement of various roof systems of the Union Station Transportation Center located at One Union Place, Hartford, CT 06103.

b) Scope of Work

Scope of work includes, but is not limited to, the performing of roofing repairs of clay tile shingle roofing and replacement of membrane roofing, copper roofing, and asphalt shingle roofing (various roofs) within the area of work as indicated in the Bid Documents. Simpson, Gumpertz & Heger (SGH), is the designer/engineer of record for this project. The work is as described in this document and IFB are complementary and are considered to comprise the Technical Specifications.

GENERAL REQUIREMENTS

SECTION 010100

SUMMARY OF WORK

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.
- B. Work will be performed at Union Station, One Union Place, Hartford, Connecticut.
- C. The work contemplated by the Contract Documents includes the work of all trades required and all labor, equipment, materials, and supervision necessary and incidental to the work indicated. The following description of the work represents a brief summary of the project and may not be all inclusive. For additional and more complete information, refer to the Drawings and the Technical Specifications.
- D. Project Mobilization:
 - 1. This work shall include Contractor and subcontractor mobilization costs. Include permits, temporary offices, bonding costs, etc.
 - 2. Attend a preconstruction meeting to be held with the Owner, the Contractor, the Engineer, the environmental consultant, and all trades and subcontractors involved in the project to discuss the work.
- E. Project General Requirements:
 - 1. This work shall include all miscellaneous costs associated with completion of the work in accordance with the Construction Documents. This shall include, but not be limited to, access to the building facade, barricades, incidental shoring, overhead protection, cleanup, dust control, noise control, layout,

equipment, waste disposal, documentation, obstruction removal and replacement, etc.

2. The building will remain occupied at all times. Coordinate with the Greater Hartford Transit District (GHDT) to maintain occupant access to the building at all times, including handicapped access. Maintain entrance through the main entrances at all times by permanent or sufficient temporary means.
3. Provide the Engineer with assistance and access to all areas of the building where the work will be performed, including incidental labor and facilities.
4. All work is to be done in accordance with applicable codes and regulations.
5. Field Verification of Existing Conditions: Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with alterations of an existing and operating building.

1.03 BASE BID

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as described in each Technical Section included in this Specification.
- C. The base bid work is intended to be conducted over two phases. Once the project is awarded, we will work with the contractor and the Owner to divide the work into two phases. We will make every effort to divide the project logically (e.g., group similar roofs together and minimize mobilizations, etc.).
- D. On a Lump-Sum Basis, provide the following roofing repairs or replacement as described below at each roof location:
 1. Roof CT1: Steep-Slope Roofs at North and South Wings
 - a. Remove the existing clay tile roofing at the locations shown on the drawings, including at the perimeter of the roof, at and around the roof dormers, and at roof penetrations. Remove existing roofing down to plywood roof sheathing (to remain). Remove the clay roof tiles, felt underlayment, and metal flashings. Salvage the existing, undamaged, clay roof tiles for reinstallation.
 - b. Provide new self-adhered membrane underlayment at the perimeter of the roof, at and around dormers, and at roof penetrations, as shown on the Drawings. Integrate self-adhered membrane underlayment with existing felt underlayment to remain.
 - c. Provide new copper flashing at the clay tile roofing including: copper cladding at dormer side walls, step flashing at rising walls (at dormers and rakes), ridge flashing, pipe penetration flashing, flashing at

dormer roofs, and eave flashing. Integrate metal flashing with the new self-adhered membrane underlayment.

- d. Reinstall existing clay roof tiles, replace damaged roof tiles in-kind.
- e. Remove and reinstall the existing snow fence at the south wing east elevation. Reuse existing base plates and provide new brackets and rails.
- f. Provide new snow cleats at the north wing east elevation, and at the west elevation of the north and south wings

2. Roof LS1: Low-Slope Roof at Center Wing

- a. Remove the existing ballasted EPDM roofing system, including, stone ballast, EPDM membrane (note that two layers are present in some locations), and insulation, down to the existing light-weight concrete topping (to remain).
- b. Inspect and sound the existing lightweight concrete topping to identify areas of delamination, spalling, or other damage.
- c. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing gypsum plank and lightweight concrete topping, adhered vapor retarder membrane, insulation including tapered insulation to provide slope-to-drain fastened to the existing gypsum plank, cover board adhered to insulation boards, and PVC roofing membrane adhered with heat-welded seams. Provide PVC flashing membrane at roof penetrations.
- d. Provide plywood and wood blocking associated with replacement roofing system, at locations shown on the Drawings and where required by the roofing system manufacturer.
- e. Provide cementitious leveling / parge coat on rising masonry walls behind pressure-treated plywood.
- f. Provide copper flashing at roof curbs, vent penetrations, and other locations as shown on the Drawings.
- g. Provide copper coping caps at the parapets.
- h. Provide roof walkway pads at locations shown on the Drawings.
- i. Remove and replace the existing clamping rings and strainers (eight total).
- j. Provide new scupper drains through the masonry parapets at locations shown on the Drawings (six total). Provide PVC-clad sheet

metal liner at new scupper drains, integrated with the new roofing system, as shown in the Drawings.

- k. Provide membrane liner at cracked drain leader pipe, at location (one total) indicated in the Drawings.
- l. Remove and reinstall the existing roof hatch; locate roof hatch in the same location as the existing.
- m. Decommission roof-mounted equipment where needed to relocate equipment onto new curbs, extend wiring and ductwork, and recommission equipment. Verify equipment is fully functional before decommission and after recommission.
- n. Remove and dispose of existing abandoned roof curbs and penetrations where indicated on the drawings and where directed in the field by the Engineer.
- o. Remove, store, and reinstall existing cameras at parapets. Coordinate with Propark prior to removal.

3. Roof LS2: Low-Slope Roof at South Addition

- a. Remove the existing flat-seam copper roofing including flat-seam copper roofing and flashing, and felt underlayment, down to the existing wood deck boards (to remain).
- b. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing wood deck boards, plywood roof sheathing fastened to the existing wood roof deck, adhered vapor retarder membrane, insulation fastened to plywood sheathing, cover board adhered to the insulation, and PVC roofing membrane adhered with heat-welded seams. Provide PVC flashing membrane at roof penetrations. Provide custom-color PVC membrane.
- c. Provide plywood and wood blocking associated with replacement roofing system, at locations shown on the Drawings and where required by the roofing system manufacturer.
- d. Provide roof walkway pads at locations indicated on the Drawings.
- e. Provide copper flashings at roof penetrations, eaves, and at rising walls.
- f. Remove existing copper gutter and provide new hung copper gutter with new zinc-tin coated copper down leaders.

- E. On a Unit Price Basis, undertake the following types of localized roofing repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.

1. Roof CT1: Steep-Slope Roofs at North and South Wings
 - a. Remove and replace deteriorated plywood roof sheathing and roof insulation.
 - b. Replace individual loose, missing, or damaged clay roof tiles in the field of the roof (not including roof tiles damaged from removal).
 - c. Repair cracked solder joints in the existing copper gutters to remain by removing the existing solder and re-soldering.
 - d. Repair holes in the existing copper gutters to remain by soldering a copper patch over the existing hole or tear.
2. Roof LS1: Low-Slope Roofing at Center Wing
 - a. Remove delaminated, spalled, and damaged areas of the lightweight concrete topping and replace with new lightweight concrete topping.
3. Roof LS2: Low-Slope Roofing at South Addition
 - a. Remove and replace deteriorated roof deck boards.

1.04 ADD ALTERNATE

- A. Provide add alternate costs for the following, provide a lump-sum cost unless noted otherwise:

1. Add Alternate #AS1: Bus Canopy Roof
 - a. Remove the existing asphalt shingle roofing, including, asphalt shingles, felt underlayment, and associated metal flashings, down to existing wood deck boards (to remain).
 - b. Provide new asphalt shingle roofing consisting of new copper flashings, self-adhered membrane underlayment at the perimeter and transitions in the roof, new felt underlayment in the field of the roof, and new asphalt shingles.
 - c. Remove and replace the copper sheet metal gutters and fascia.
 - d. On a Unit Price Basis, undertake the following types of localized roofing repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - (1) Remove and replace deteriorated roof deck boards.
 - (2) Remove and replace deteriorated wood soffit boards.
 - (3) Reattach existing sound, loose soffit boards.

2. Add Alternate #AS3: Inactive Platform Canopy Roof
 - a. Remove the existing asphalt shingle roofing, including, asphalt shingles, felt underlayment, and associated metal flashings, down to existing wood deck boards (to remain).
 - b. Provide new asphalt shingle roofing consisting of new copper flashings, self-adhered membrane underlayment at the perimeter and transitions in the roof, new felt underlayment in the field of the roof, and new asphalt shingles.
 - c. Abate and properly dispose of the existing roofing cement identified as containing asbestos in accordance with the Section – 070150.23 – Asbestos-Containing Roofing Removal.
 - d. Remove and replace the copper sheet metal gutters and fascia.
 - e. Remove and replace the bird netting in place below the canopy.
 - f. On a Unit Price Basis, undertake the following types of localized roofing repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - (1) Remove and replace deteriorated roof deck boards.
 - (2) Remove and replace deteriorated wood soffit boards.
 - (3) Reattach existing sound, loose soffit boards.
 - (4) Extend existing down leaders, as needed, so that they discharge at grade or onto a lower roof (assume up to 16 ft extension length).
3. Add Alternate #LS2: Omit work described above in Paras. 1.03-D-3-b, 1.03-D-3-d, and 1.03-D-3-e. Provide new copper roofing consisting of (from bottom to top): plywood sheathing, self-adhered high temperature membrane underlayment, rosin paper slip sheet, and copper roofing as follows:
 - a. At low-slope areas of the roof, provide flat-seam copper roof panels with fully-soldered joints except at expansion joints designed to accommodate thermal movement.
 - b. At steep-slope areas of the roof, provide standing-seam copper roof panels.
4. Add Alternate #LS3: Low-Slope Roof at East Entrance Canopy

- a. Remove the existing EPDM roofing system including: EPDM membrane and insulation down to the existing plywood roof deck (to remain).
- b. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing plywood roof deck, adhered vapor retarder membrane, tapered insulation to provide slope to drain fastened to plywood roof deck, cover board adhered to insulation, PVC roofing membrane adhered with heat-welded seams.
- c. Remove and replace the existing clamping rings and strainers (two total), existing drain bodies to remain.
- d. Provide plywood and wood blocking associated with replacement roofing system, at locations shown on the Drawings and where required by the roofing system manufacturer.
- e. Provide copper flashing at roof edges and at the base of the rising wall.

1.05 DEFINITION

- A. Engineer: Where Engineer is referenced throughout these specifications, it refers to the Engineer of Record, Simpson Gumpertz & Heger Inc. (SGH).
- B. Owner: Where Owner is referenced throughout these specifications, it is in reference to the Greater Hartford Transit District.

1.06 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to:
 1. Section 010290 – Bird Netting (Add Alternate #AS3).
 2. Section 013000 – Submittals.
 3. Section 014000 – Quality Control and Project Procedures.
 4. Section 015000 – Construction Facilities and Site Use.
 5. Section 016000 – Temporary Protection.
 6. Section 035300 – Concrete Topping Repair.
 7. Section 061000 – Rough Carpentry.
 8. Section 061500 – Wood Deck Boards and Soffit.
 9. Section 070150 – Asbestos-Containing Roofing Removal (Add Alternate #AS3).

10. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
11. Section 073213 – Clay Tile Roofing.
12. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
13. Section 076000 – Sheet Metal Flashing.
14. Section 076100 – Copper Roofing (Add Alternate #LS2).
15. Section 079200 – Joint Sealant.

1.07 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
 1. Connecticut State Building Code, current edition.
 2. ASTM International (ASTM): Standards as specified in each Technical Section.
 3. Other standards and guidelines, as references in each Technical Section.

1.08 QUALITY CONTROL AND PROJECT PROCEDURES

- A. Refer to Section 014000 for general quality control and project procedures.
- B. Attend a preconstruction conference to be held with GHTD, Engineer, the Contractor's field superintendent, and all other involved trades to discuss and coordinate the work covered under this Section.
- C. Perform all work in strict accordance with all applicable laws and regulations of the building code and with all authorities having jurisdiction. All such requirements shall take precedence over the requirements of the specifications, except where the requirements of the Specifications are more exacting or stringent.

1.09 SUBMITTALS

- A. Refer to Section 013000 for general submittal procedures.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 010290

BIRD NETTING
(ADD ALTERNATE #AS3)

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings and specifications, at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications, and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 ADD ALTERNATE

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following rough carpentry work as described below at each roof location:
 - 1. Add Alternate #AS3: Inactive Platform Roof
 - a. Remove existing bird netting at the underside of the canopy, locations indicated on the Drawings.
 - b. Provide new bird netting assembly connected to the underside of the canopy where the existing netting is removed.

1.04 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to, the following:
 - 1. Section 013000 – Submittals.

2. Section 014000 – Quality Control and Project Procedures.
3. Section 015000 – Construction Facilities and Site Use.
4. Section 016000 – Temporary Protection.
5. Section 061500 – Wood Deck Boards and Soffit.
6. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
7. Section 076000 – Sheet Metal Flashing.

1.05 REFERENCED STANDARDS

- A. In general, follow all requirements, recommendations, and procedures of the following standards and publications, except where these Contract Documents (project Specifications and Drawings) are more stringent:
1. Connecticut State Building Code, current edition.
 2. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 3. Product manufacturer's written recommendations.
 4. ASTM International (ASTM) standards as specified or referenced herein.

1.06 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 2. Shop Drawings: Provide shop drawings consisting of reflected ceiling plans showing extent of new netting, locations of net zippers, spacing and type of attachment hardware and details showing attachment of cable / netting to various construction (e.g., masonry, steel truss, wood, etc.).

3. Sample: Provide the following samples:
 - a. Proposed netting assembly including perimeter condition and attachment points.
 - b. Of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.07 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.

1. Installation of netting system, 100 SF minimum.
2. Connection of netting system to various construction (as applicable):
 - a. Masonry: 1 EA
 - b. Steel Truss: 1 EA
 - c. Wood: 1 EA

1.08 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

1.09 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Installer Qualifications: Engage an experienced installer who has a minimum of five years of experience with successfully completed work described in this Section.

1.10 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

- A. Bird Netting: Bird netting constructed of black high-density polyethylene (HDPE) that is abrasion, flame, rot, and UV resistant, with 3/4 in. knotted square mesh. Color to be black.
 - 1. Net Rings: metal net rings used to attach the netting to the cables, to close seams, and to attach net zippers.
 - 2. Net Zippers: Heavy duty, marine-grade zipper with 3/4 in. fabric tape, open top and auto lock slider; 48 in. long, color to be black.
- B. Tension Cable: Stainless steel cable, 3/32 in. dia., with 900 lbs breaking strength.
 - 1. Turnbuckles: Stainless steel, hook and eye turnbuckles.
 - 2. Cable thimbles: Stainless steel, size to fit cable.
 - 3. Eyebolts (for anchoring to metal and masonry): Extreme duty stainless steel eyebolt, 2 in. long with 1/4-20 stainless steel hex nut.
 - 4. Masonry fasteners: Drive-in-type expansion anchor with nylon sleeve and a 1/4 in. dia. stainless steel pin with a mushroom head, length to provide a minimum of 1-1/4 in. embedment. Acceptable manufacturers include Rawl-Powers Inc., Hiliti, or Elco Construction Products.
 - 5. Screw Eyes (for attaching to wood): Extreme duty stainless steel screw eyes, 2 in. long.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings.
- B. Visually inspect the surfaces that will receive the netting hardware and all areas that will end up behind or inside the netting installation. Note damaged surfaces or incomplete construction that could compromise the bird netting installation.

3.02 GENERAL WORKMANSHIP

- A. Do not use powder-activated fasteners unless specifically approved by the Engineer. Provide all hardware, including nails, screws, staples, bolts, straps, hangers, anchors, etc., as required for attaching wood to itself or any other material.
- B. Install bird netting hardware as recommended by the manufacturer.

- C. Install perimeter and support hardware at spacing as recommended by the manufacturer. Attach bird netting to installed hardware. Install access or additional support hardware as necessary to provide a complete and secure system.
- D. Cut the netting as necessary to fit the area. Provide multiple pieces of netting joined together as needed to fit the area. Join the pieces together with seam fastening hardware as recommended by the manufacturer.
- E. Avoid contact of netting with machinery, vehicles, extreme heat, tree branches, etc. Make necessary adjustments to keep netting a sufficient distance from these objects or conditions.
- F. Locate zippers in netting based on approved shop drawings, generally located in the center of each netted area, spaced no more than 20 ft apart. Install zippers in netting in accordance with manufacturer's recommendations.
- G. Finished installation to be taught, free of wrinkles, gaps, and openings.

END OF SECTION

SECTION 013000

SUBMITTALS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The General Conditions of the Contract for Construction and the General Requirements are hereby made a part of this Section.

1.02 SCHEDULE

- A. Within ten working days after award of the Contract, submit an estimated progress schedule in Critical Path Method (CPM) in accordance with the General Conditions. Unless agreed to otherwise in writing, allowable work hours and dates are specified in Section 015000. Scheduling shall include provisions for mobilization, materials cure time, adverse weather, and materials procurement. Construction schedule shall include coordination with all involved trades. After the schedule's initial acceptance, at each Progress Meeting, present such revisions to the construction schedule as may be required by current or projected status of the project.
- B. Submit to the Owner's Representative a projected monthly cash flow analysis, including the expected monthly progress payments throughout the course of the project.

1.03 SITE USE PLAN

- A. Submit Plan and/or Elevation Drawings of the site showing the proposed access, staging, debris collection, and locations of job trailer, portable toilets, and material storage for review by GHTD. Make all reasonable changes to the plan, as required by the GHTD at no additional cost.

1.04 ADMINISTRATIVE ACTIONS AND ADMINISTRATIVE SUBMITTALS

- A. The following submittals must precede mobilization:
 - 1. List of subcontractors and qualifications, showing that each subcontractor meets the specific experience requirements of these Specifications. Include reference names and telephone numbers of owners/clients from relevant jobs.
 - 2. List of principal suppliers and fabricators.
 - 3. Schedule of Values.
 - 4. Contractor's construction schedule.
 - 5. Schedule of principal products.

6. Submittal Schedule.
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of permits.
10. Copies of authorizations and licenses from governing authorities for performance of the work.
11. Initial progress report.
12. Certificates of insurance and insurance policies.
13. Performance and payment bonds.
14. Data needed (if any) to acquire GHTD's insurance.

1.05 MATERIALS AND PROCEDURES

- A. Submit to the Engineer copies of Manufacturer's Spec and Product Data Sheets; Safety Data Sheets (SDS); and recommended installation procedures, temperature limitations, and mix designs for each material listed in the Technical Sections of the Specifications.
 1. Submit the required materials in time to allow for review by the Engineer and resubmittals, if needed, without delaying the work. Do not order materials or start work before receiving the Engineer's written approval. Provide a cover sheet with each submittal indicating the information required in Para. 1.10.C.
- B. Submit one electronic or paper copy of the manufacturer's printed data stamped with the Contractor's approval and stating its intended use to the Engineer for review. After review of the manufacturer's printed data, the Engineer will stamp one copy noting, if necessary, any further action required and return an electronic copy to the Contractor.

1.06 TESTING

- A. Fulfill or submit ACI, ASTM, ANSI, commercial, and other standards' schedule of tests and progress reports in strict accordance with the Specifications as set forth therein.

1.07 CERTIFICATIONS

- A. Submit certifications (in time for review to prevent delay in the work) by the producers of the materials that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.

1.08 SAMPLES

- A. Submit a sample of each material specified in the Technical Sections of the Specifications at the request of the Engineer for the Engineer's approval. Submit sample panels of construction assemblies, color charts, etc., as required by each Specification for the Engineer's approval.
- B. Receive, check, approve, and stamp all samples required by the Contract Documents before submitting to the Engineer for review. Provide three of each sample.
- C. Allow ample time for review and approval of samples before beginning work.
- D. Provide a cover sheet with each sample indicating the information required in Para. 1.10.C.
- E. Distribute approved samples, as required, for performance of the work. Two samples will be returned to the Contractor. Maintain a complete and organized file with one of each sample in the Contractor's site office. Distribute the second sample to the subcontractor or Supplier based on the Contractor's needs. Provide additional samples where, in the Contractor's opinion, the Contractor needs more than two.

1.09 SHOP DRAWINGS

- A. Submit Shop Drawings as required by the Technical Sections of the Specifications. Shop Drawings shall be stamped by a Connecticut-licensed Professional Engineer where required by the Technical Sections of the Specifications.
- B. Submit to the Engineer a preliminary and final schedule of Shop Drawing submissions. Submit checked Shop Drawings stamped with the approval of the Contractor to the Engineer for review per the accepted schedule of Shop Drawing submissions.
- C. Shop Drawings shall demonstrate that the Contractor understands the intent of the design as detailed and specified in the Contract Documents and shall show materials (kinds, quality, shapes, and sizes), details (fabrication, construction, assembly, and installation), and all required dimensions and measurements.
 - 1. Precheck Shop Drawings prior to submission to Engineer for conformity of details with the Contract Documents and as coordinated with other work. The signature of a representative of the Contractor, indicating that the Drawings have been prechecked is required. The Contractor shall be wholly responsible for the conformity of dimensions and details of the Shop Drawings to the Contract Documents.
 - 2. Submission solely of copies of SGH design drawings is not an acceptable Shop Drawing. Shop Drawings shall take into account actual field conditions and deviations (if any) from Contract Documents, and shall include all dimensions field verified by the Contractor.
 - 3. After the Engineer has received the Shop Drawings, they will be reviewed and necessary corrections will be marked on reproducible drawings, which will then

be returned to the Contractor. Corrections shall then be made on the Drawings and resubmitted as required. This procedure will be continued until the Drawings are released for construction.

- D. All Shop Drawings shall have final review by the Engineer before materials are ordered or fabrication is begun. Use only unmarked final approved Shop Drawings in the field. Do not proceed with the work before receiving Engineer's approval of final Shop Drawings.
- E. Keep at least one copy of each approved Shop Drawing in the field office and do not keep Drawings not bearing evidence of release for construction by the Engineer on the job.
- F. Do not proceed with the work before receiving Engineer's approval of final Shop Drawings.

1.10 SUBMISSION REQUIREMENTS

- A. Submit all submittals in an orderly sequence and sufficiently in advance of construction requirements to allow ample time for checking, resubmitting, and rechecking, if needed, without delaying the work. Accompany submittals with transmittal letter, in duplicate.
- B. Do not order materials or start work before receiving the Engineer's written approval.
- C. Submittal cover sheets shall include the following:
 - 1. Project title and number.
 - 2. Unique Submittal Number: Number each submittal as follows, based on specific section, paragraph, and line number in the Technical Sections of the Specification where the submittal is required.
 - a. Technical Specification Section number, paragraph number, line number. If resubmitted, use R1 designation after Line No. for first resubmittal, R2 for second resubmittal, etc. For example, a submittal required in this line item of the Specifications should be 013000-1.10.C.2.a.
 - 3. Date of original submission and revisions, if any.
 - 4. The names of the following:
 - a. Submitting Contractor or subcontractor.
 - b. Submitter's Engineer or detailer, when pertinent.
 - c. Supplier.
 - d. Manufacturer.

5. Identification of product or material, including a complete description of the material and intended use.
 6. Relation to adjacent structure or materials.
 7. Field dimensions clearly defined as such.
 8. Applicable standards such as ASTM number or Federal Specification.
 9. Identification of deviations, if any, from the Contract Documents.
 10. Contractor's stamp initialed or signed certifying to review of submittal, verification of field measurements, and compliance with the Contract Documents.
 11. A blank space, 3 in. x 4 in., for the Engineer's stamp at the lower right-hand corner of Drawings, when possible.
- D. Sequentially number each page of the cover page and product information for each product. Indicate the submittal item number on each page.

1.11 RESUBMISSION REQUIREMENTS

- A. Revise original submittal, as required, and resubmit as specified for the initial submittal. Clearly indicate by clouding and use of revision-level number in a triangular symbol all changes that have been made, including those requested by the Engineer.

1.12 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute copies of Shop Drawings and Project Data that carry the Engineer's stamp to:
1. Contractor's file.
 2. Jobsite file.
 3. Owner's Representative.
 4. Record documents file.
 5. Subcontractors.
 6. Supplier.
 7. Fabricator.

1.13 ENGINEER'S RESPONSIBILITIES

- A. Review submittals and transmit to the Contractor within ten working days after receipt of submittal. Review for design concept of project and information given on the Contract Documents.

- B. Return submittals to the Contractor for distribution.
- C. The Engineer's Stamp will govern the action on all submittals. The stamp will have the following actions with the appropriate category checked:

Approved: No corrections, approved as submitted. Contractor shall obtain and distribute adequate prints for construction, including one print of each for the Owner's project representative and then return the transparencies to the subcontractor or supplier from whom he originally received them.

Accepted: Reviewed for conformance to the Contract Drawings, but item is not within Engineer's scope of work to approve the item (e.g., construction schedule or sequencing).

Approved as Corrected: Minor corrections made to the submittal. However, fabrication may begin in conformance to the corrections. No resubmission is required.

Revise and Resubmit: Major corrections have been made and the submittal to be corrected and resubmitted for approval. No work shall be released for fabrication or construction.

Not Approved: Submittal is not in conformance with the Contract Documents. When returning Drawing, Engineer will state reasons for rejection. Contractor shall first obtain a record print and then forward transparency to source for correction of original Drawings and resubmission of a new transparency.

Resubmit for Record Copy: Minor corrections made to the submittal. However, fabrication may begin in conformance to the corrections. Corrected record copy must be submitted.

Not Reviewed: Submittal not reviewed by Engineer, typically for one of the following reasons: Insufficient information for Engineer to review required submittal, submittal provided to Engineer for informational purposes only, or submittal not required.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 014000

QUALITY CONTROL AND PROJECT PROCEDURES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The General Conditions of the Contract for Construction and the General Requirements are hereby made a part of this Section.

1.02 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including but not limited to:

1. Section 010100 – Summary of Work.
2. Section 010290 – Bird Netting (Add Alternate #AS3).
3. Section 013000 – Submittals.
4. Section 015000 – Construction Facilities and Site Use.
5. Section 016000 – Temporary Protection.
6. Section 035300 – Concrete Topping Repair.
7. Section 061000 – Rough Carpentry.
8. Section 061500 – Wood Deck Boards and Soffit.
9. Section 070150.23 – Asbestos-Containing Roofing Removal (Add Alternate #AS3).
10. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
11. Section 073213 – Clay Tile Roofing.
12. Section 075419 – Polyvinyl-Chloride (PVC) Roofing.
13. Section 076000 – Sheet Metal Flashing.
14. Section 076100 – Copper Roofing (Add Alternate #LS2).
15. Section 079200 – Joint Sealant.

1.03 REFERENCED STANDARDS

- A. Refer to the individual Technical Sections of these Specifications.

1.04 SEQUENCING AND SCHEDULING

- A. Contractor shall develop a Plan for phasing (sequencing) the work that will allow continuous access to the main entrance and south entrance (accessible entrance).
 - 1. If the south entrance must be closed for any amount of time, the Contractor shall provide signage to direct individuals accessing and leaving the station to the north end by the transit center to use as the accessible egress.
- B. Plan, schedule, and execute work in cooperation with other trades employed on the project by promptly completing the work of this Section as required to meet the project schedule and so as not to impede other trades. Coordinate the work of this Section with other trades so the intent of the Drawings and Specifications is carried out regardless of the narrow scope definitions provided with each Section. Make arrangements with the other trades and with the GHTD to minimize the disruption to building occupants.
- C. Schedule and execute all work to avoid exposing the building and its contents to inclement weather. Prevent water intrusion through the temporary protection.
- D. Allow the GHTD and Engineer access to the work. Where the work is accessible only by vertical access equipment (e.g., scaffolding, swing stage, boom lift), allow the GHTD and Engineer access to the work via the Contractor's equipment.
- E. Attend weekly construction meetings with the Engineer and GHTD's representative to discuss schedule and progress.

1.05 FIELD MEASUREMENT

- A. The existing conditions and measurements shown on the Drawings are estimated from documentation of a few select locations. Verify all site conditions and dimensions by measurements in the field. Verify existing construction in consideration of the special conditions associated with working in, repairing, and modifying an existing building. Field measure all existing conditions and dimensions prior to submitting Shop Drawings and ordering materials.
 - 1. Notify the Engineer immediately of any inconsistencies between field conditions and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.
 - 2. Plans and dimensions under which the work is to be performed are based on the available drawings of the existing conditions and are presented for information only. No additional compensation or time extension will be made for dimensional errors or discoverable inaccuracies about existing conditions in the Contract Documents.

1.06 PERFORMANCE REQUIREMENTS

- A. Refer to the individual Technical Sections of these Specifications.

1.07 QUALITY CONTROL AND ASSURANCE

- A. Provide a quality control program that includes, but is not limited to, the following:
 - 1. Fulltime monitoring and review of the progress of the work to ensure that all items are constructed in accordance with the Drawings, the Specifications, and all referenced standards.
 - 2. Inspection of all materials and procedures to ensure conformity to Contract requirements and that all materials are new and undamaged except where existing materials are indicated to be reused. Inspect all substrate preparation for conformance with the Contract Documents and manufacturer's instructions, and make corrections as needed prior to the Engineer's inspection of the preparation.
 - 3. Establishment of procedures for executing the work.
 - 4. Inspection of work in progress to ensure that work is being done in accordance with established procedures, manufacturer's instructions, and specific instructions from the Engineer, if given. Replace deficient or rejected work at no cost to the GHTD and in such a manner as to prevent delay to the project.
- B. All procedures, operations, and equipment used on the job shall comply with all applicable municipal and safety regulations, including OSHA guidelines.

1.08 DOCUMENTATION OF EXISTING CONDITIONS

- A. Document all existing interior and exterior building conditions prior to the start of work (photographs, video, notes, etc.).
- B. Document existing landscaping and site conditions. After the project is complete, clean up the site and restore all areas of pavement, concrete sidewalks, landscaping, and plantings damaged or disturbed by the work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Submit a plan for the Owner's approval showing areas for staging the work, including areas for storing materials, locating dumpsters, portable toilets, construction trailer, Contractor parking, etc. Make changes as required by the Owner.
- B. Protect all delivered materials to the site in the manufacturer's unopened bags or containers. All materials are to be new, of recent manufacture, and delivered in their original, labeled, unopened containers without damage. Handle all materials so as to prevent damage. Remove from the site any materials that are damaged, arrive in damaged or open containers, and unlabeled materials. Protect ALL materials from the weather while transported, stored, and delivered. Protect packaged materials from moisture, corrosion, and deterioration.

- C. Promptly remove from the site all materials rejected by the Engineer or harmed by moisture anywhere, at any time, during transportation, storage, handling, and installation.
 - 1. Do not store any materials directly on the ground – rather, place materials on pallets, thoroughly and completely covered to fully protect from moisture.
 - 2. Store all materials in original, unopened, labeled containers and packaging, and in compliance with the manufacturer’s directions. Comply with all practices recommended by the manufacturers of all materials, including (but not limited to), manufacturer’s minimum and maximum temperature, humidity, shelf life, and other requirements for storage.
 - D. Storage and handling of all materials on the construction platform and staging shall be in strict conformance to all loading limitations, limitations stated in construction documents for this project, and all limitations in applicable manufacturers’ technical data and regulatory requirements for staging and work platforms.
 - E. Store materials in a secure area designated by the GHTD with adequate tie-downs against wind gusts. The Contractor is responsible for providing secured, locked storage of materials and equipment intended to be stored on site. Storage of materials on site is at the risk of the Contractor. Storage of materials on site is permitted only at locations approved by the GHTD.
 - F. Store all materials between 40°F and 80°F, or within temperature range required by the manufacturer. If exposed to lower temperature, restore to proper temperatures before use. Uncured materials (sheets and canned goods) shall be marked with the date of manufacture and shelf life; products shall not be used beyond allowable dates. Do not dilute primers, adhesives, coatings, or sealants. Keep containers closed, except when removing materials from them.
 - G. Do not store materials on any building in a manner that might cause distortion or damage to roofing, structure, or any other component of the supporting structures.
 - H. The Contractor shall repair or replace, at his own expense, damaged materials or structures damaged by the Contractor as directed by the Engineer.
 - I. Use identical materials from the same manufacturer and batch throughout the project, unless specifically directed otherwise by the Engineer.
- 1.10 PRECONSTRUCTION CONFERENCE
- A. Attend a preconstruction conference to be held with representatives of the Owner, the Contractor, the Engineer, and all involved trades to discuss the remedial construction work.

PART 2 – PRODUCTS

- A. Refer to the individual Technical Sections of these Specifications.

PART 3 – EXECUTION

3.01 KNOWLEDGE OF PROJECT DOCUMENTS

- A. Provide copies of the Drawings and Specifications for the work to all crews and subcontractors. Ensure that all workers are familiar with the Details and Specifications pertinent to their items of work. Each crew shall maintain a copy of the Drawings and Specifications pertinent to their work at their work area at all times (Drawings and Specifications at a central location, such as a jobsite trailer, is not sufficient).

3.02 MOCKUPS

- A. Provide mockups of the work described in the Technical Sections of the Specifications on the building in locations approved by the Engineer and designated to receive the work. Mockups shall be used for testing installation methods; approval of aesthetics; to determine construction problems, if any; and, if necessary, to refine the installation methods in accordance with the design intent prior to proceeding with construction. Repeat the mockups as many times as is necessary for the approval of the Engineer. The approved mockups shall become part of the finished work and will be used by the Engineer as a basis to evaluate the work that follows.
- B. Perform field testing as described in the Technical Sections. Notify the Engineer at least 48 hrs prior to field testing so that the Engineer may be present to witness testing.

END OF SECTION

SECTION 015000

CONSTRUCTION FACILITIES AND SITE USE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The General Conditions of the Contract for Construction and the General Requirements are hereby made a part of this Section.

1.02 USE OF SITE

- A. The Contractor shall use only authorized access to the existing building and shall neither block nor interfere with traffic or parking facilities, except as authorized in writing by the GHTD.
- B. The Contractor shall perform all work without interfering with the scheduled normal operation of the building, except as provided in the Contract, and shall coordinate the work properly with the building's function, including preservation of security. The Contractor shall not interfere or disrupt activities without the expressed approval of, and coordination with, the GHTD's authorized representative. The premises shall be left in a neat, clean, and safe condition at the end of each day's work.
- C. The Contractor shall not block any entrances or exits from the building; maintain emergency egress for building occupants. Coordinate with the GHTD's Representative if access to the loading dock area is not available for deliveries. The Contractor shall convey debris to the ground in approved containers and dispose of debris off site in a legal manner. The Contractor shall not leave equipment unattended on the ground at any time. The Contractor shall provide suitable barricades and warning signs near work areas as necessary to protect the public.
- D. The Contractor shall maintain use of the active train platform by the public throughout the duration of the project. Coordinate work requiring access to the active platform with GHTD and Amtrak.
- E. Working hours shall be 7:00 a.m. to 3:30 p.m., Monday to Friday, except legal holidays. Except in emergencies, the Contractor shall inform the GHTD Project Manager at least 48 hrs in advance for requests to perform work outside normal hours.
- F. During the period of the work, a representative of the General Contractor shall be available by phone 24 hrs a day for emergencies.

1.03 CONDITION OF USE

- A. Maintain strict supervision of use of temporary services. Enforce conformance with applicable standards. Enforce safe practices. Prevent abuse of services and systems. Prevent damage to finishes. Maintain, service, and clean facilities. Protect systems

from freezing. The Owner reserves the right to restrict or disallow the use of facilities and services that are abused by the Contractor, employees, or subcontractors.

1.04 VEHICULAR ACCESS AND PARKING

- A. Parking is available for a cost near the site in multiple paid parking lots or metered parking spaces.
- B. Post signs where hazards may create poor visibility or new traffic patterns.
- C. Ensure emergency vehicle access to the building and adjacent buildings.

1.05 CONSTRUCTION AREA AND FACILITIES

- A. The allowed construction area consists of paved and landscaped areas. All construction trailers, materials storage, sanitary facilities, etc., will be located in a localized area as directed by the GHTD.
- B. Waste disposal containers are permitted to be located in the construction area following the provisions specified within this Section.
- C. At the discretion of the GHTD and Engineer, mobile and fixed cranes may be located in the construction and lay down areas. Coordinate crane locations with the Owner's representative in advance of mobilization. Locate buried utilities and verify bearing capacity of areas intended for crane traffic.
- D. After completion of the work, the Contractor must restore the construction and laydown areas, the surrounding and adjacent buildings, and landscaping to their original construction.

1.06 HOISTS AND SCAFFOLDING

- A. Provide hoists and scaffolding as required to complete the Work. All hoists and scaffolding must be designed to ensure the safety of building occupants, the general public, and construction workers and to protect the building components. All hoists and scaffolding are to comply with OSHA regulations.
- B. Loads imparted by hoists and scaffolding must not overload any building components.
- C. Method of attachment of scaffold and hoists must be submitted to the Engineer for review.
- D. Plans for all hoists and scaffolding, including capacity of existing building components, security provisions, lighting, scaffolding enclosure, protection of existing roof surfaces, signage, sidewalk protection and provisions for mitigation of falling hazards, must be reviewed and signed by a Connecticut-licensed Professional Engineer on the Contractor's behalf and submitted to the Engineer and GHTD's Representative for review and approval. The Contractor is solely responsible for a safe design.

E. Scaffold:

1. The design of scaffolding must include provisions, such as toe plates and netting, that reduce the risk of falling materials and/or debris.
2. Scaffolding design must also take into consideration that tenant operation must proceed uninterrupted.

F. Hoists:

1. Provide, maintain, and operate material hoists.
2. Hoists shall be of adequate capacity for the loads to be carried and shall have all required safeguards. Hoist cars shall be of required size and design for the hoisting of all "normal"-size building materials with all equipment necessary for operation.
3. Install hoists on the exterior of the building at locations approved by the GHTD's Representative.
4. Submit details for bearing locations and connections of hoists to existing structure to Engineer. Loads and capacity of building components supporting loads also to be included in submittal.
5. Contractor must submit a safety plan and hoisting procedure that address issues of building occupants and pedestrian safety to Engineer and Owner's Representative.

1.07 CRANES

A. Provide cranes as required to complete the work. All cranes must be reviewed/ designed to ensure the safety of building occupants, the general public, and construction workers and to protect the building components. Loads imparted by cranes must not overload any building components or buried utilities. Plans and procedures for all cranes, including capacity of existing building components; capacity of soil/foundation, particularly over buried utilities and paving; security provisions; signage; sidewalk protection; and provisions for mitigation of falling hazards must be reviewed and signed by a Connecticut-licensed Professional Engineer on the Contractor's behalf and submitted to the Engineer for review and approval. The Contractor is solely responsible for a safe design. The crane procedures must also take into consideration that tenant operation of the building must proceed uninterrupted.

1. Provide, maintain, and operate cranes.
2. Cranes shall be of adequate capacity for the loads to be carried and shall have required safeguards.
3. Located cranes in areas approved by the GHTD's Representative.

4. Contractor must submit a safety plan and operational procedure that addresses issues of building occupants and pedestrian safety to the GHTD's Representative and Engineer.
5. Retract crane loads before rotating.
6. Crane loads are to be anchored redundantly.

1.08 SHORING

- A. Plans for all shoring, including capacity of existing building components, security provisions, lighting, protection of existing structures, signage, and provisions for mitigation of falling hazards, must be reviewed and signed by a Connecticut-licensed Professional Engineer on the Contractor's behalf and submitted to the Engineer and GHTD's Representative for review and approval. The Contractor is solely responsible for a safe design.

1.09 TEMPORARY PROJECT OFFICES AND ENCLOSURES

- A. Temporary office space will not be available in the building. The Contractor may provide a portable office trailer in the approved construction area for the Contractor's use.
- B. Contractor will equip the temporary field office with electricity, lighting, and plan layout table.
- C. Keep the following at the site of the work at all times:
 1. The most recent revision of the Drawings and Specifications, including all changes made by addenda, sketches, bulletins, and change orders.
 2. Architectural and Structural Drawings representing the original design.
 3. Safety Data Sheets (SDS Sheets).
 4. The most recent issue of approved submittals. Obsolete or unapproved submittals and Material and Safety Data Sheets shall not be kept at the jobsite.
 5. All material evaluation reports.
 6. Engineer and Contractor field reports, and daily Contractor job reports.
 7. Health and Safety Plans.
- D. Provide temporary enclosures for storage of salvaged and new materials, tools, and other project-related materials. Provide enclosures equipped with heat and ventilation for products requiring controlled conditions. The GHTD will approve and designate locations for additional storage if necessary.

1.10 SECURITY

- A. The Contractor shall be responsible for the security of his work area, equipment, tools, materials, and temporary facilities.
- B. The Contractor shall provide chain link fencing with gates around the construction site and laydown areas. The chain link fencing shall be 6 ft high, galvanized steel, with diamond mesh fabric. The Contractor shall provide all necessary fencing accessories including, but not limited to, doors/gates, tension wire, tension (stretcher) bars, braces, etc., to meet fabric tension requirements. Provide doors/gates in fencing at convenient locations, with locks operated by identical keys at each lock for the construction site and laydown areas. Provide the GHTD with a key. Provide concrete fence post pedestals weighing a minimum of 250 lbs that are able to resist an overturning moment of 250 lb-ft.
- C. A log-in sheet is to be maintained at the temporary office, which will include information such as the subcontractor's name, pieces of equipment brought on site, number of men, time in, and time out.
- D. Advise Contractors' forces on site of appropriate standards of conduct. Persistent use of profanity or comments directed at individuals outside the workforce may be interpreted as harassment or disorderly conduct and will result in the immediate dismissal of the harassing individual.
- E. Provide effective means of securing or disabling ladders, scaffolding, staging, hoists, or material handling equipment where they may be accessed by unauthorized individuals.

1.11 TEMPORARY ELECTRICITY

- A. The GHTD will provide access to power at designated locations for Contractor use. Generators are not allowed. Coordinate with the GHTD to identify circuits for construction activities. Do not overload single outlets with multiple plugs. Verify that the capacity of the circuit will sustain the anticipated tool loads.
- B. All extension cords shall be provided by the Contractor or subcontractor requiring the power.
- C. Provide artificial lighting for construction operations, when natural or ambient light is not adequate for work. Light values shall be adequate for the task in progress. Provide supplemental light at hazards.

1.12 TEMPORARY WATER

- A. The Contractor may use water from a location designated by the GHTD at no charge for on-site construction purposes.
- B. The Contractor shall provide and maintain necessary temporary connections to the source of temporary supply. Make connections to existing facilities using back-flow

protection. Take measures to conserve water. Free use of water will be discontinued if, in the opinion of the Engineer or GHTD, water is wastefully used.

- C. The General Contractor, at his own expense, shall provide an adequate supply of drinking water from approved sources of acceptable quality, satisfactorily cooled, for his employees and those of his subcontractors.

1.13 TEMPORARY SANITARY FACILITIES

- A. Toilet facilities in the building will not be available. The contractor shall provide portable toilet facilities to be placed at a location approved by the GHTD. Keep toilet facilities clean and sanitary at all times, to the GHTD's satisfaction. Provide facilities to meet OSHA standards.

1.14 TEMPORARY FIRE PROTECTION

- A. The contractor shall provide adequate fire protection and fire prevention for the project and in no case less than that required by applicable city, county, state, and federal laws.
- B. Furnish and maintain at least one currently inspected 20 lb capacity multiclass ABC fire extinguisher in the immediate vicinity where welding tools or torches are in use.
- C. Fully charged fire extinguishers must be within 10 ft of any open flame at all times. Multiple open flames require multiple extinguishers. Any discharged extinguisher must be removed from the site and replaced with a fully charged extinguisher immediately.
- D. Follow FM Global's Hot Work Permit System to manage all hot work, which includes, but is not limited to, welding, brazing, cutting, soldering, torch-applied roofing, mechanical grinding, and all other work that involves open flames or producing heat or sparks. Fill out and follow all requirements of FM Global's Hot Work Permit Form.

1.15 ACCESS/EGRESS

- A. The Contractor shall maintain all emergency egress routes through doors in the work area and continuing out through construction laydown area.
- B. The building and the active train platform will be in use during construction. A public accessible entrance shall be maintained during construction.

1.16 COVERED WALKWAYS

- A. Install temporary overhead protection at building entrances, for an appropriate distance from the building, when performing construction work above the entrance.
- B. Comply with standards and code requirements for erecting structurally adequate overhead protection. Erect overhead protection using appropriate scaffold and wood plank decking to provide safe passage.

1.17 JOBSITE ACCESS

- A. Provide ready and easy access for the GHTD's Representative and Engineer to all parts of the Work, whenever and wherever it is in progress, including provisions for safety and safety equipment of first quality and in excellent condition.
 - 1. Failure to provide access may result in rejection of that portion of the Work to which access has been denied.
 - 2. If ladders, ramps, staging, lifts, and scaffolding that are erected, maintained, or operated for the Contractor's use in the performance of the Work, or safety equipment provided by the Contractor to the GHTD's Representative or Engineer are not acceptable by the user, this will be considered as denial of access to the Work.

1.18 ROOF PROTECTION

- A. The General Contractor shall take strict precautions against unnecessary traffic on the existing roof surfaces to remain. Provide adequate protection boards to protect the existing roof surfaces to remain from damage.
- B. After a satisfactory completion of all work in the area of the roof, the General Contractor shall be responsible for damages to the roof caused by work or materials as part of the project.

1.19 FIRST AID

- A. Contractor shall provide a first aid kit with adequate provisions for the materials being used on site. Contractor shall maintain an envelope to hang above the first aid kit, which will contain all of the Material and Safety Data Sheets for materials being used on this Project.

1.20 WATER POLLUTION CONTROL

- A. Undertake all precautions necessary to prevent discharge of unacceptable pollutants used in and resulting from the work into storm water system.

1.21 NOISE CONTROL

- A. All demolition and construction work that creates excessive noise (air hammer operations, hydrodemolition, etc.) shall be reviewed with the GHTD as to the types of equipment that the contractor proposes to use during normal business hours and obtain the GHTD's approval for such use. The use of generators is not allowed. Noise limits shall conform to the requirements of the local ordinances.

1.22 DISPOSAL

- A. Dispose of debris, as required, by state and local ordinances. Do not throw debris from scaffolding or roof. Lower debris in containers to trucks or other approved

containers on the ground. All debris shall be removed from the site, and the site returned to its original condition upon completion of the project.

- B. Contractor may locate dumpsters in areas under construction at locations approved by the GHTD. Protect the pavement below the dumpster. Close dumpsters at the end of the day and when not in use. Place the dumpster in a manner that will not inhibit access to the building and parking areas or routine vehicular traffic. Maintain fire lane access at all times throughout the site.

1.23 PROTECTION OF WORKS

- A. The Contractor shall obtain the advice and recommendations of his installers for procedures to protect their work. Installers are responsible for protecting their work and that of other trades while working at the jobsite or in an area thereof. When the installer is no longer working in the area or at the jobsite, the Contractor shall provide protective measures and materials to ensure that each element will be without damage or deterioration throughout the remainder of the construction period up to the date of substantial completion. Remove protective coverings and materials at the appropriate time, but no later than final cleaning operations.
- B. The Contractor is responsible for the adequacy and safety of any temporary covers and should upgrade the cover as he deems appropriate and as required by the weather conditions or building officials. Temporary anchors and seals shall not interfere or coincide with, or adversely affect, installation of permanent seals, anchors, and windows.

1.24 CLEANUP

- A. Clean up and leave the site in a neat and orderly condition at the end of each workday. Sweep all dust or debris from sidewalks, grounds, roofs, or other building surfaces.
- B. Keep the project area clean. Control accumulation of waste materials and rubbish. Remove all construction debris and food waste daily.
- C. Control airborne dust and other contaminants throughout construction. Sprinkle debris with water to control dust if necessary. Control effluent so as not to damage cars or property and not to contaminate the storm sewer system.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 016000

TEMPORARY PROTECTION

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The General Conditions of the Contract for Construction and the General Requirements are hereby made a part of this Section.

1.02 SUMMARY

- A. Protect building, surrounding buildings and vehicles, building occupants and contents, pedestrians, landscaping, mechanical equipment, and site against all risks associated with this work. The Contractor is solely responsible for the watertight integrity of the roofs, exterior walls, flashing, and adjacent building components at all times during the construction. Repair any damage to original conditions caused by this work to the satisfaction of the GHTD using mechanics skilled in appropriate trade.
- B. Provide and maintain temporary means of protection for all materials to be left in place, and for all materials to be removed, stored, and reinstalled. Restore all protected areas and stored materials to their original condition upon completion of the work.

1.03 GENERAL

- A. The Contractor shall provide for the safety of the general public in the vicinity of all work areas as well as provide safety for the workers on the job.
- B. Coordinate the work to keep the building watertight at all times. This may require some out-of-sequence work to be scheduled with the other involved contractors to prevent the building from being exposed to the weather.
- C. Store all materials removed for reinstallation in a location approved by the Owner. Store materials on pallets, off the ground. Protect all materials from the weather and from damage during storage.
- D. Protect all incomplete and exposed areas of the building from the effects of inclement weather at the end of every workday. The building must be maintained in a watertight condition and all interior finishes must be kept dry throughout the duration of the Work. Do not leave the building unprotected from the weather overnight. Coordinate protection with all trades and the Owner as required so that no gaps in coverage exist.

1.04 SUBMITTALS

- A. Submit shop drawings on how the Contractor plans to protect existing roofing and rooftop elements to remain in place during construction.

1.05 SITE AREA PROTECTION

- A. Provide barriers as required to prevent public access to project areas, to provide for the GHTD's use of the site, and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Identify and protect existing utilities. Confer with respective utility company when overhead lines, exposed connections, or underground utilities are within potential contact area of construction activities. Take necessary protective action as part of this Contract.
- C. Protect landscape and grounds within and adjacent to Project Area.
 - 1. Protect all trees and vegetation within the construction and lay down areas. Where necessary, install plywood enclosures at the dripline of the tree branches. Do not fasten enclosure to trees.
 - 2. Protect lawn areas by laying down heavy-duty canvas tarpaulins and covering with bark. Repair lawn areas where damaged.
 - 3. Submit proposed protection techniques for review. Proceed only according to approved methods.
- D. Protect walkways and curbs, where vehicles are expected to cross or park. Use planking or sheet materials to evenly distribute loads from wheels and stabilizers. Take measures to prevent staining or chipping. Restore paving where damaged or made unsightly by construction activities.
- E. Protect all mechanical equipment and lines on the exterior walls, roofs, and around the building perimeter. Restore and repair all equipment where damaged.
- F. Control water and site drainage. When altering discharge or drainage patterns, direct water to prevent nuisance and hazardous conditions.
- G. The premises, including access drives and parking areas, shall be left in a neat, clean, and safe condition at the end of each day's work.

1.06 EXTERIOR AREA PROTECTION

- A. Protect all exterior building walls, roofs, and details that are not part of the Work in this project. Provide protection of all windows, louvers, doors, masonry, metal flashings, skylights, and roofs not included in the scope of work during demolition and construction.
 - 1. Protect vertical surfaces with rigid insulation and heavy-duty polyethylene sheets to prevent impact damage and dust penetration.
 - 2. Provide covers, pad, and draping to resist work-related abuse.

- B. Provide protection for all mechanical equipment and lines during demolition and construction. Provide covers and pads as required to protect all equipment.
- C. Protect all building materials to remain in place during construction or to be reinstalled on the building, including roofing outside the area of work, windows, masonry, skylights, mechanical equipment, etc. as indicated on the Drawings. Repair all damage to the building caused by the work. Mark any damage to the materials to remain in place and report it promptly to the Engineer and General Contractor for repair.

1.07 INTERIOR AREA PROTECTION

- A. Minimize impact to the building interior for the work of this contract to the greatest extent possible. Where possible, avoid construction workers from walking through the building or accessing the interior.
- B. If interior work is necessary or interior finishes will be impacted by the work of this contract, protect existing surfaces and finishes designated to remain. Provide covers, pads, and draping to resist work-related abuse. Tape or seal edges to protect interior spaces from dust and grit. Restrain cover materials that may scrub or abrade finishes. Protect vertical surfaces with rigid insulation and heavy-duty polyethylene sheets to prevent impact damage and dust penetration.
- C. Protect all finishes and furnishings from dust and debris during construction. Do not damage interior finishes or furniture with sealant or tape from the temporary protection. Clean all areas upon removal of the temporary protection.
- D. Restore finishes that have been damaged or made unsightly to their original condition.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Minimum Temporary Exterior Protection at Windows, Louvers, and Doors:
 - 1. Polyethylene: 6 mm minimum thick, opaque polyethylene.
 - 2. Non-marking tape to seal edges of polyethylene sheet.
 - 3. Plywood: APA sheathing to meet U.S. Product Standard PS 1-83, Exposure 1, Group 1, C-C (or better), 1/2 in. thick.
- B. Minimum Temporary Protection to Roofing:
 - 1. Polyethylene: 6 mm minimum thick, opaque polyethylene.
 - 2. Insulation Board: Minimum 1-1/2 in. EPS insulation board.

3. Plywood: Douglass Fir, Larch, and/or Southern Yellow Pine, 5/8 in. minimum thick.
4. Straps or ballast as necessary to prevent wind uplift.

PART 3 – EXECUTION

Not Used.

END OF SECTION

TECHNICAL SPECIFICATIONS

SECTION 035300

CONCRETE TOPPING REPAIR

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY: BASE BID

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following repairs to the lightweight concrete topping as described below:
 - 1. Roof LS1: Low-Slope Roofing at Center Wing: Survey the existing roof for areas of delamination, spalls, and other damage. Perform a chain drag at the existing concrete topping surface to identify areas of delamination.
- D. On a Unit-Price Basis, undertake the following types of localized repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - 1. Roof LS1: Low-Slope Roofing at Center Wing: Remove delaminated, spalled, and damaged areas of the lightweight concrete topping and replace with new concrete topping.

1.03 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to:
 - 1. Section 013000 – Submittals.

2. Section 014000 – Quality Control and Project Procedures.
3. Section 015000 – Construction Facilities and Site Use.
4. Section 016000 – Temporary Protection.
5. Section 061000 – Rough Carpentry.
6. Section 075419 – Polyvinyl Chloride (PVC) Roofing.

1.04 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
1. Connecticut State Building Code, current edition.
 2. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 3. Product manufacturer's written recommendations.
 4. ASTM International (ASTM): Standards as specified or referenced herein.
 5. American Concrete Institute (ACI):
 - a. ACI 305 – Hot Weather Concreting.
 - b. ACI 306 – Cold Weather Concreting.
 - c. ACI 308 – Standard Practice for Curing Concrete.
 6. International Concrete Repair Institute: ICRI 3730 – Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion.

1.05 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.

- c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 - d. Concrete mix proportions and curing procedures.
2. Existing Condition Drawings: Submit verification drawings showing results of chain drag and conditions survey. Include all areas of observed delamination's, spalls, and other damage requiring repair. Show extent and dimensions of each area of deterioration.
 3. Samples: Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.06 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.
 1. Concrete Topping Repair Surface Preparation: 1 SF minimum.
 2. Concrete Topping Repair: 1 SF minimum.

1.07 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.
- B. Store cementitious materials and aggregates, covered and in a dry location.

1.08 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Installer Qualifications: Engage an experienced installer who has a minimum of five years of experience with successfully completed work described in this Section.

1.09 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Specialty Mortar for Topside Concrete Deck Repairs: Rapid-setting gypsum-free repair mortar, which can be applied in lifts down to a minimum of 1/4 in. SikaQuick 2500 by Sika Corporation or equal.
 - 1. Extend specialty mortar with 3/8 in. aggregate as described in Para. 3.06 below or as recommended by the mortar manufacturer based on the depth of the repair.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.
- B. Examine all lightweight concrete topping surfaces to identify locations of delaminated, spalled, or damaged lightweight concrete topping. Sound all lightweight concrete surfaces by dragging a chain across the surface and listening for anomalies indicative of delaminations. Document all areas of delaminations, spalls, and damage requiring repair. Notify the Engineer in writing of any unforeseen conditions. Do not commence work until all defects are remedied.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, site work, landscaping, and the building interior from all risks associated with the work. Protect persons, property, and site as required. Repair all damaged elements of the building caused by the work of this Section at no additional cost to the Owner.

3.03 DEMOLITION AND SURFACE PREPARATION FOR TOPSIDE REPAIRS

- A. Remove all loose and unsound concrete in the areas to be repaired. Remove concrete to a minimum depth of 1/4 in.

- B. Provide 1/4 in. deep saw-cut edges around the perimeter of the repair areas, normal to the face of the surrounding concrete. The saw cuts shall form polygons that enclose the deteriorated area.
- C. Remove all deteriorated concrete, dirt, oil, grease, or other bond-inhibiting materials from the exposed sound concrete by the manufacturer's recommended mechanical means to provide an aggregate-fractured surface.
- D. Substrate should be saturated surface dry (SSD) with no standing water during application.

3.04 REMOVAL OF DETERIORATED CONCRETE

- A. Protect the interior from dust and fumes related to the work. Continuously monitor the interior for dust during chipping procedure.
- B. Use concrete saws, chipping hammers, and other demolition equipment and cutting tools appropriate for the work and approved by the Engineer.
- C. Accomplish the demolition for topside repairs using chipping hammers no larger than nominal 15 lb class.
- D. Take care in removing the lightweight concrete topping to not remove the full depth of the topping; do NOT damage the existing gypsum roof planks below the lightweight concrete topping.

3.05 MORTAR PLACEMENT FOR TOPSIDE REPAIRS

- A. Condition concrete surfaces to receive shallow concrete repairs in accordance with the manufacturer's written instructions and as outlined in Para. 3.03 above.
- B. Place mortar/concrete for shallow repairs in accordance with the manufacturer's written instructions.
- C. Provide a means of accurately measuring the amount of water introduced to the mix. Follow the manufacturer's written directions for addition of water.
- D. Surface of concrete repair to be flush with surrounding existing lightweight concrete topping to remain. Finish the surface with surface roughness as required by the vapor retarder manufacturers written instructions.

3.06 SPECIALTY MORTAR/CONCRETE

- A. For repairs 1 in. or greater in depth, add 3/8 in. coarse aggregate to specialty mortar to produce specialty mortar/concrete. Proportion, mix, and place it in accordance with the manufacturer's written instructions.
 - 1. Aggregate must be clean, well graded, saturated surface dry, have low absorption and high density, and be certified by the aggregate supplier to meet ASTM C33 and to be nonreactive.

3.07 CURING CONCRETE AND MORTAR REPAIRS

- A. After the finishing operation is completed, cure mortar and concrete in accordance with the manufacturer's written instructions. Provide temporary roofing over the concrete patch and replace with permanent roofing after the patch and surrounding concrete are sufficiently dry.
- B. Curing compounds are prohibited.
- C. During the curing period, the concrete shall be protected from damage due to mechanical disturbances, such as shock and vibration, due to adjacent construction activity. All finished concrete surfaces shall be protected from damage.
- D. Appearance of plastic shrinkage cracks due to inadequate finishing and curing shall be cause for rejecting the work so affected. Surface concrete in the rejected area shall be removed and replaced at no additional cost to the Owner or his representatives.

3.08 CLEANUP

- A. Stains, efflorescence, fins, and other surface deposits resulting from the work of this Section shall be removed by methods acceptable to the Engineer. The Contractor must provide a smooth, uncontaminated surface for installation of the new roofing system.
- B. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 061000

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 BASE BID

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following rough carpentry work as described below at each roof location:
 - 1. Roof LS1: Low-Slope Roof at Center Wing
 - a. Provide pressure-treated wood blocking and plywood associated with the new membrane roofing system at locations shown on the Drawings, including, but not limited to, roof parapets, mechanical equipment curbs and sleepers, and the roof hatch.
 - b. Provide cementitious leveling or parge coat behind pressure-treated plywood sheathing at rising masonry walls.
 - 2. Roof LS2: Low-slope Roof at South Addition
 - a. Provide pressure-treated plywood sheathing over the existing wood decking.

- b. Provide pressure-treated wood blocking associated with the new membrane roofing system at locations shown on the Drawings including but not limited to the roof eave, diverter curb, and base of wall.
 - c. Provide cementitious leveling or parge coat behind pressure-treated plywood sheathing at rising masonry walls.
- D. On a Unit Price Basis, undertake the following types of localized work at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
- 1. Roof CT1: Steep-slope Roofs at North and South Wings
 - a. Remove and replace deteriorated plywood roof sheathing and roof insulation.

1.04 ADD ALTERNATE

- A. Provide add alternate costs for the following:

- 1. Add Alternate #AS1: Bus Canopy Roof
 - a. Provide pressure-treated wood blocking at gutter edge and as needed to provide slope to drain at the gutter.
- 2. Add Alternate #AS3: Inactive Platform Roof
 - a. Provide pressure-treated wood blocking at gutter edge and as needed to provide slope to drain at the gutter.
 - b. Provide cementitious leveling or parge coat behind pressure-treated plywood sheathing at rising masonry walls.
- 3. Add Alternate #LS2: Omit work described above in Para. 1.03-C-2-b. Provide pressure-treated wood blocking associated with the new copper roofing system at locations shown on the Drawings, including, but not limited to, the roof eave and expansion joints.
- 4. Add Alternate #LS3: Low-Slope Roof at Center Wing Entrance Canopy
 - a. Provide pressure-treated wood blocking associated with the new membrane roofing system at locations shown on the Drawings, including, but not limited to, the roof edge and base of wall.
 - b. Provide cementitious leveling or parge coat behind pressure-treated plywood sheathing at rising masonry walls.

1.05 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to, the following:
1. Section 013000 – Submittals.
 2. Section 014000 – Quality Control and Project Procedures.
 3. Section 015000 – Construction Facilities and Site Use.
 4. Section 016000 – Temporary Protection.
 5. Section 061500 – Wood Deck Boards and Soffit.
 6. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3)
 7. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
 8. Section 076000 – Sheet Metal Flashing.
 9. Section 076100 – Copper Roofing (Add Alternate #LS2).

1.06 REFERENCED STANDARDS

- A. In general, follow all requirements, recommendations, and procedures of the following standards and publications, except where these Contract Documents (project Specifications and Drawings) are more stringent:
1. Connecticut State Building Code, current edition.
 2. AWI Quality Standard: Comply with applicable requirements of Architectural Woodwork Quality Standards, Premium Grade, published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.
 3. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 4. Product manufacturer's written recommendations.
 5. ASTM International (ASTM) standards as specified or referenced herein.
 6. FM 1-29 Loss Prevention Data Sheet for Above Deck Roof Components

1.07 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:

- a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
2. Shop Drawings: Coordinate with shop drawings required by other Sections to show plywood and wood blocking on respective shop drawings. Indicate wood blocking size, plywood thickness, and associated fasteners including type, size, and spacing.

1.08 MOCKUPS

- A. Participate in the mockups required by other Sections to provide plywood and wood blocking, as necessary, to construct a complete mockup, representative of the final construction.

1.09 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.
- B. Store all wood prior to use by neatly stacking in a manner to avoid distortion of wood. Cover with canvas tarpaulins (not polyethylene) arranged to allow air movement beneath the covers. Do not use any stock with excessive twist or bow, or that has become wet. Use fasteners as required, with a minimum of two fasteners per length of lumber, stagger anchors for wood pieces more than 4 in. wide and install two anchors at the ends of each length.

1.10 QUALITY CONSTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Installer Qualifications: Engage an experienced installer who has a minimum of five years of experience with successfully completed work described in this Section.

1.11 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the

termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Lumber for Tapered Wood Blocking: Southern yellow pine, No. 2 grade, pressure treated, or approved equal.
- B. Plywood: APA “Exterior” rated sheathing (A-C veneer) to meet requirements of PS 1-09, made with Douglass fir or southern pine, 4 ft x 8 ft x 5/8 in. thick, unless otherwise indicated. Plywood to be pressure treated.
 - 1. Roof Sheathing at Roof LS2: Provide 3/8 in. thick plywood, APA Exposure 1 rated sheathing.
- C. Tapered Shims: Continuous red cedar bevel siding, Grade B or better.
- D. Wood Treatment:
 - 1. Pressure-Treated Lumber: All lumber is to be preservative-treated under pressure. Treatment to be ACQ –B, ACQ-D, or CA- B. Treatment shall be in accordance with Federal Specification TT-W-571 and AWWPA Standards U1, T1, and P5. The treatment used is to be stamped on each piece by the processor. The minimum net retention of preservative shall be 0.25 lb/cu ft of wood for ACQ-B, 0.15 lb/cu ft of wood for ACQ-D, and 0.10 lb/cu ft of wood for CA-B C. All treated lumber must be redried after treatment to a maximum moisture content of 19% and bear a stamp or tag indicating “KDAT” or “ADAT.”
 - 2. Pressure-Treated Plywood: All plywood is to be preservative treated under pressure with ACQ-D. Treatment shall be in with Federal Specification TT-W-571 and AWWPA Standards U1, T1 and P5. The treatment used is to be stamped on each piece by the processor. The minimum net retention of preservative shall be 0.15 lb/cu ft of plywood. All treated plywood must be re-dried after treatment to a maximum moisture content of 19% and bear a stamp or tag indicating “KDAT” or “ADAT.”
- E. Fasteners:
 - 1. For Attaching Wood Blocking to Concrete Roof Deck: Use 3/8 in. dia. stainless steel expansion anchors, length as required to provide 5 in. minimum embedment in the concrete roof deck, Kwik-Bolt 3 by Hilti, or approved equal.
 - 2. For Attaching Wood Blocking and Plywood to Masonry: Use 1/4 in. dia. flat-head, corrosion-resistant concrete screws approved for use with alkaline copper quaternary (ACQ) pressure-treated lumber. Tapcon by Buildex, Kwik-Con II (stainless steel type 316) by Hilti, or approved equal. Pre-drill holes with drill bits required by manufacturer. Install fasteners with minimum 1 in. embedment in concrete and with minimum 1-1/4 in. embedment in masonry.

3. For Wood-to-Wood Connections: No. 10 stainless steel screws with tapered Phillips head, length to provide full depth embedment in plywood and 1-1/4 in. minimum embedment in blocking.
 4. For Attaching Roof Sheathing at Roof LS2: No. 10 stainless steel nails.
- F. Insulation (for use where (E) insulation below plywood sheathing is deteriorated): Rigid glass-fiber-faced isocyanurate foam insulation boards, 2 in. thick. Minimum compressive strength of 25 psi conforming to ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- G. Cementitious Parge Coat: Parge coat consisting of a mix of cement, sand, and water meeting the requirements below. Apply to the substrate in 1/4 in. to 1/2 in. thickness.
1. Cement: Portland cement meeting the requirements of ASTM C150, Type 1 or Type 2.
 2. Sand: Sand meeting the requirements of ASTM C144.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings.

3.02 GENERAL WORKMANSHIP

- A. Do not use powder-activated fasteners unless specifically approved by the Engineer. Provide all hardware, including nails, screws, staples, bolts, straps, hangers, anchors, etc., as required for attaching wood to itself or any other material.
- B. Mill lumber as detailed to match adjoining elements to provide smooth transitions to adjacent surfaces. Lumber is shown as nominal size.
- C. Countersink fasteners into wood only to depth for fastener heads to be flush.

3.03 WOOD-BLOCKING INSTALLATION

- A. Screw or bolt wood blocking to concrete or masonry substrates as required where shown on the Drawings. Unless specified otherwise, space expansion fasteners in concrete roof deck 24 in. o.c. maximum and space screw fasteners to masonry or concrete 12 in. o.c. maximum.
- B. Unless specified otherwise, securely fasten blocking at 12 in. o.c. maximum to underlying blocking, or as shown or required to prevent movement or uplift of any roofing or flashing attached to blocking.

3.04 PLYWOOD INSTALLATION

- A. Install plywood with the "A" side to the exterior. Where two or more courses of plywood are required, install plywood in a "running bond" pattern and staggering vertical joints in successive courses.
- B. Attach plywood where shown on the Drawings with specified fasteners at 12 in. o.c. in the field and 6 in. o.c. at the edges of the plywood sheets.
- C. Install all screw and nail heads flush to the plywood surface.
- D. Gap all joints in plywood 1/8 in.

3.05 NAILER CONSTRUCTION AT LOW SLOPE ROOFING

- A. Coordinate the installation of the low-slope-roof insulation with the wood-blocking installation with the Roofing Contractor.
- B. Install wood blocking after the vapor retarder is installed. Starting at the bottom of the slope, install the wood blocking perpendicular to the slope of the roof.
- C. Install the second layer and subsequent layers of wood blocking to match the overall insulation thickness.
- D. Stagger width of top layers of blocking to avoid through penetration joints between blocking and insulation.
- E. Taper top layer of wood blocking as needed to match the slope of the roof insulation such that the top of the wood blocking is flush with the top of the cover board.

3.06 CEMENTITIOUS LEVELING OR PARGE COAT

- A. Follow all applicable requirements for mixing, placement, and curing of cementitious materials required in Section 035300 – Concrete Topping Repair.
- B. Apply the cementitious parge at a thickness 1/4 to 1/2 in. thick, packing into void and open joints in the existing backup masonry.
- C. Cured cementitious parge coat must be well bonded (i.e., no areas of debonding or delaminations) and must not exhibit excessive cracking.

END OF SECTION

SECTION 061500

WOOD DECKING AND SOFFIT

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 BASE BID

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following wood decking repairs as described below at each roof location.
 - 1. Roof LS2: Low-Slope Roofing at South Addition
 - a. Provide supplemental fasteners at the ends of all existing deck boards to the existing wood rafters.
- D. On a Unit Price Basis, undertake the following types of localized wood decking repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - 1. Roof LS2: Low-slope Roofing at South Addition
 - a. Remove and replace deteriorated roof deck boards.

1.04 ADD ALTERNATE

- A. Provide add alternate costs for the following:

1. Add Alternate #AS1: Bus Canopy Roof
 - a. On a Unit Price Basis, undertake the following types of localized work where directed by the Engineer in the field. Quantities for Unit Price work as shown on the Drawings.
 - (1) Remove and replace deteriorated roof deck boards.
 - (2) Remove and replace deteriorated wood soffit boards.
 - (3) Reattach existing sound, loose soffit boards.
2. Add Alternate #AS3: Inactive Platform Canopy Roof
 - a. On a Unit Price Basis, undertake the following types of localized work where directed by the Engineer in the field. Quantities for Unit Price work as shown on the Drawings.
 - (1) Remove and replace deteriorated roof deck boards.
 - (2) Remove and replace deteriorated wood soffit boards.
 - (3) Reattach existing sound, loose soffit boards.

1.05 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to, the following:
 1. Section 010290 – Bird Netting (Add Alternate #AS3).
 2. Section 013000 – Submittals.
 3. Section 014000 – Quality Control and Project Procedures.
 4. Section 015000 – Construction Facilities and Site Use.
 5. Section 016000 – Temporary Protection.
 6. Section 061000 – Rough Carpentry.
 7. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
 8. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
 9. Section 076000 – Sheet Metal Flashing.
 10. Section 076100 – Copper Roofing (Add Alternate #LS2).

1.06 REFERENCED STANDARDS

- A. In general, follow all requirements, recommendations, and procedures of the following standards and publications, except where these Contract Documents (project Specifications and Drawings) are more stringent:
1. Connecticut State Building Code, current edition.
 2. AWI Quality Standard: Comply with applicable requirements of Architectural Woodwork Quality Standards, Premium Grade, published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.
 3. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 4. Product manufacturer's written recommendations.
 5. ASTM International (ASTM) standards as specified or referenced herein.
 6. FM 1-29 Loss Prevention Data Sheet for Above Deck Roof Components

1.07 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material, where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 2. Verification Drawings: Provide roof plans showing locations of deteriorated or rotted roof deck boards and deteriorated or loose soffit boards. Indicate dimensions and number of deteriorated/rotted boards.

1.08 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with

any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.

1. Base Bid: Replacement of wood deck board at Roof LS2, one location.
2. Add Alternate #AS1 and #AS3:
 - a. Reattachment of wood soffit board, one location on each roof.
 - b. Replacement of wood soffit board, one location on each roof.

1.09 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.
- B. Store all wood prior to use by neatly stacking in a manner to avoid distortion of wood. Cover with canvas tarpaulins (not polyethylene) arranged to allow air movement beneath the covers. Do not use any stock with excessive twist or bow, or that has become wet. Use fasteners as required, with a minimum of two fasteners per length of lumber, stagger anchors for wood pieces more than 4 in. wide and install two anchors at the ends of each length.

1.10 QUALITY CONSTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Installer Qualifications: Engage an experienced installer who has a minimum of five years of experience with successfully completed work described in this Section.

1.11 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Wood deck boards: Douglass Fir, Larch, or Southern Yellow Pine, No. 1 or No. 2 grade as graded in accordance with SPIB, pressure-treated with wood preservative and kiln-dried after treatment (KDAT); size to match existing.
 1. Pressure-Treated Lumber: All lumber is to be preservative-treated under pressure. Treatment to be ACQ –B, ACQ-D, or CA- B. Treatment shall be in

accordance with Federal Specification TT-W-571 and AWP Standards U1, T1, and P5. The treatment used is to be stamped on each piece by the processor. The minimum net retention of preservative shall be 0.25 lb/cu ft of wood for ACQ-B, 0.15 lb/cu ft of wood for ACQ-D, and 0.10 lb/cu ft of wood for CA-B C. All treated lumber must be redried after treatment to a maximum moisture content of 19% and bear a stamp or tag indicating "KDAT" or "ADAT."

- B. Soffit boards: Tongue-and-Groove, size and shape to match existing.
- C. Tapered shims or cants: Continuous red cedar bevel siding "clapboard," Grade B or better.
- D. Fasteners:
 - 1. To Attach Wood Deck Boards: No. 12 x 4 in. long galvanized coated screws. Fasten ends of boards with one fastener at each end.
 - 2. To Attach Tongue-and-Groove Soffit Boards: Stainless steel 16 ga bard nail, 2 in. length. Fasten though shoulder of the tongues with the fasteners at a 45° angle, fasteners spaced 12 in. o.c.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings.

3.02 DEMOLITION

- A. Remove existing rotted or damaged soffit or deck board by removal of fasteners, and, where necessary, cutting of the rotted or damaged board. Take care when cutting the rotted or damaged board to not damage adjacent or underlying undamaged materials.
- B. Remove entire board length; do not remove partial boards.

3.03 GENERAL WORKMANSHIP

- A. Refer to Section 061000 – Rough Carpentry.

3.04 DECK AND SOFFIT BOARD INSTALLATION

- A. Install the deck and soffit boards plumb, level, true, and straight with no distortions. Shim as required using concealed shims. Coordinate new wood deck and soffit boards with the existing to remain, shimming and sanding new wood as necessary to provide a smooth transition to the existing

- B. Maintain the same joint locations and joint construction (i.e., butt joints, scarf joints, mitered corners, etc.) as the existing deck and soffit boards.
- C. Anchor deck and soffit boards to existing wood blocking. Provide all hardware, including screws, nails, bolts, straps, hangers, anchors, etc., as required for attachment. Fasten with countersunk, concealed fasteners and blind nailing as required for a complete installation.

3.05 ATTACHMENT OF EXISTING DECK BOARDS AT LS2

- A. Attach the ends of all deck boards to the underlying existing wood roof rafters with one fastener at each end.
- B. Locate fasteners 1 in. minimum for all edges of wood deck board and 1 in. minimum from any existing fasteners (to remain).

- C. Install the fasteners centered on the wood deck board with 1-1/2 in. edge distance from the end of the board (approximately centered on the rafter below).

END OF SECTION

SECTION 070150

ASBESTOS-CONTAINING ROOFING REMOVAL (ADD ALTERNATE #AS3)

PART 1 - GENERAL

1.1 SCOPE

- A. The work specified herein shall be the removal of asbestos-containing roofing materials by persons who are knowledgeable, qualified and trained in the removal, treatment, handling and disposal of asbestos-containing roofing material, and the subsequent cleaning of the affected environment. The Contractor shall have a Competent Person in control on the job site with authority to take prompt corrective measures at all times during roofing removal work. This person must comply with applicable Federal, State and Local regulations which mandate work practices, and be capable of performing the work of this contract.
- B. The Owner may retain the services of a Project Monitor for protection of its interests and those using the building. Area air sampling and visual inspection to ensure proper clean-up of the work area will be conducted as deemed necessary.
- C. Protect and preserve in operating condition, all utilities traversing the building and site. Damage to any utility due to work under this Contract shall be repaired to the satisfaction of the Owner at no cost to the Owner.

1.2 DESCRIPTION OF WORK – (ADD ALTERNATE #AS3)

- A. The Contractor shall supply all labor, materials, equipment, services, insurance and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations and these specifications.
- B. Building inspections have identified the following materials to be ACM:
 - 30 lb. Black Felt Layer (Tar Contamination) – CT1 – north wing, west side (at northwest corner by AS3 roof edge)
 - Black Roofing Mastic/Tar – Next to AS3 Roof (northeast edge at clay tile roof)
 - Black Mastic/Tar on Stone – AS3 (Building Perimeter)
- C. If any of the above confirmed asbestos-containing roofing materials are to be disturbed during demolition/renovation activities, then they must be removed, handled and disposed of by either a licensed Asbestos Contractor or OSHA trained Roofing Contractor with the proper training for asbestos-containing roofing removal.
- D. Building inspections have identified the following materials to be <1% ACM:
 - Old Brown Skirt Flashing Caulk – Perimeter of Building (LS2 Roof)
 - Black/White Skirt Flashing Mastic – Perimeter of Building (AS3 Roof)

- E. Materials with reported asbestos concentrations less than one percent asbestos (<1%) are not considered ACM for the purpose of disposal. However, in accordance with the OSHA Construction Asbestos Standard, 29 CFR 1926.1101 any material with asbestos-content is considered regulated by OSHA and contractors are required to comply with the regulations including but not limited to: regulated areas, negative exposure assessments (NEA), employee exposure monitoring, personnel protective equipment (PPE), and wet removal/disposal methods, if these materials are disturbed.
- F. Building floor plans indicating locations of asbestos containing material is included with this specification. **Quantities shall be field verified by Contractor.**
- G. A copy of existing surveys, sampling reports, including a building roof plan indicating affected areas, will be available for the project.

1.3 DEFINITIONS

- A. AGENCY - The authoritative force, usually at the state level, or their representative.
- B. ASBESTOS-CONTAINING MATERIAL (ACM) – Any material containing more than one percent asbestos.
- C. COMPETENT PERSON – In addition to the definition in 29 CFR 1926.32(f), one who is in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation plan (40 CFR Part 763) for Supervisor, or its equivalent.
- D. HIGH-EFFICIENCY PARTICULATE AIR (HEPA) - A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles 0.3 microns in diameter.
- E. LEAK-Tight - Solids or liquids cannot escape or spill out. It also means dust-tight.
- F. REGULATED AREA - Area established by the Competent Person to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the Permissible Exposure Limit (PEL).
- G. NON-FRIABLE REGULATED ASBESTOS-CONTAINING MATERIAL - Means any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section I, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.
- H. REGULATED ASBESTOS-CONTAINING MATERIAL (RACM) – means (a) Friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II non-friable ACM that has high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

1.4 REFERENCES

- A. The current issue of each document shall govern. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.
 - 1. Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101-Asbestos
 - 2. Environmental Protection Agency (EPA) 40 CFR 61, Subpart M-National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Revision; Final Rule. 40 CFR 763, Appendix C to Subpart E – Asbestos Model Accreditation Plan (MAP)
 - 3. State of Connecticut, Department of Public Health Regulations (CTDPH) Sections 19a-332a-1 Through 19a-332a-16 – Standards for Asbestos Abatement

1.5 SUBMITTALS AND NOTICES

- A. Prior to commencement of asbestos abatement work, submit to the A/E and Construction Coordinator and receive approval and/or acknowledgement of following:
 - 1. Asbestos worker medical clearance to wear a respirator documentation
 - 2. Asbestos worker & Competent Person training documentation
 - 3. Asbestos worker respiratory fit testing documentation
- B. Within 35 days following the date the asbestos waste trailer leaves the job site, submit to the A/E and Owner:
 - 1. Waste shipment record for disposal of asbestos roofing material

1.6 PERSONNEL PROTECTION

- A. Provide and require all workers to wear protective clothing and half face respirators when present in the Regulated Area established by the Competent Person.

1.7 WORKER TRAINING REQUIREMENTS

- A. Training for the Competent Person, Supervisor, and Workers shall meet the requirements of Federal and State regulations. Minimum training requirement for the State of CT for non-friable asbestos roofing removal is an 8 hour Asbestos Roofing Contractor Certification.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene sheeting and disposal bags shall be six (6) mil.
- B. Labels and signs shall conform to applicable regulations.

2.2 TOOLS AND EQUIPMENT

- A. Air monitoring equipment of the type and quantity required to monitor operations and conduct personnel exposure surveillance per OSHA requirements.
- B. Protective clothing, respirators, filter cartridges, air filters and sample filter cassettes shall be provided in sufficient quantities for the project.

PART 3 - EXECUTION

3.1 PREPARATION OF WORK AREA

- A. Post warning signs meeting the specifications of OSHA 29 CFR 1910 and 29 CFR 1926.1101 at each Regulated Area. In addition, signs shall be posted at all approaches to Regulated Areas so that an employee may read the sign and take the necessary protective steps before entering the area.
- B. Prior to start of work, and as needed during the job, the Competent Person shall inspect the work site and determine whether the roofing material is non-friable asbestos containing material and will likely remain non-friable asbestos containing material during removal activities.
- C. Shut down and seal (with duct tape and 6-mil. poly sheeting) windows & roof level heating and ventilation air intakes that are in position to entrain dust or vapors from the roofing activities. Coordinate shut down of mechanical systems with Owner personnel. Where intake shutdown is not feasible (as determined by Owner), supply and install horizontal or vertical extensions to relocate the opening of the air intake outside or above the regulated area so as not to entrain dust and vapor emissions from the roofing and re-roofing activity.
- D. Cover floor/ground of the Work Area perimeter prior to removal, with one layer of six (6) mil polyethylene sheeting, duct taped securely at the perimeter to catch any falling or loose debris during removal.

3.2 ASBESTOS-CONTAINING ROOFING MATERIAL REMOVAL

- A. All work shall be performed in accordance with OSHA Construction Industry Standard (29 CFR 1926.1101) and EPA NESPAP Standard (40 CFR 61) and applicable State of Connecticut Regulations.
- B. A Competent Person shall be on the job at all times to ensure proper work practices throughout the project.
- C. The Contractor shall utilize methods which do not saw, sand, abrade or grind the asbestos-containing roofing material. Should roofing materials be identified as regulated asbestos-containing material additional federal and state regulations, training, licenses and certifications shall apply.

- D. Remove asbestos-containing shingles and associated cements or mastics using manual methods (such as axe, knife, or shovel). Do not saw, sand, abrade or grind these materials.
- E. Pick up or HEPA vacuum asbestos-containing roofing debris from non-intact roofs prior to removal of the roofing. Bag debris for disposal.
- F. Utilize wet methods to remove asbestos-containing roofing materials unless such wet methods are not feasible or will create safety hazards, as determined and documented in writing by the competent person.
- G. HEPA vacuum asbestos-containing dust and debris left after the removal of asbestos-containing roofing. Where asbestos-containing roofing is removed, HEPA vacuum the roof decking and adjacent surfaces following roofing removal. Bag dust and debris for disposal.
- H. Asbestos-containing roofing material shall be carried or passed to the ground by hand or lowered to the ground by crane or hoist. Do not drop or throw asbestos-containing roofing material to the ground or into the dumpster. Transfer lowered asbestos-containing roofing material to the leak tight disposal dumpster carefully so as not to disperse dust.

3.3 DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL

- A. Disposal of asbestos-containing and/or asbestos contaminated material shall occur at an authorized site and must be in compliance with the requirements of, and authorized by the Office of Solid Waste Management, Department of Energy and Environmental Protection, State of Connecticut, or other designated agency having jurisdiction over solid waste disposal.
- B. Asbestos warning signs must be attached to containers used to transport asbestos-containing waste. Warning signs shall be posted during loading and unloading of disposal containers. The signs must be posted so that they are plainly visible.
- C. Label containers of asbestos-containing waste material or wrapped asbestos-containing waste material using warning labels specified by OSHA 29 CFR 1926.1101. Label Asbestos-containing waste material destined for off-site transport with the name of the waste generator and the location where the waste was generated.

3.4 CONTRACTOR PERSONAL AIR MONITORING RESPONSIBILITY

- A. Conduct air sampling to assure that workers are using appropriate respiratory protection in accordance with OSHA Construction Industry Standard 1926.1101. Documentation of air sampling results must be recorded at the work site within twenty-four (24) hours and shall be available for review until the job is complete.

- B. Produce a written initial asbestos exposure assessment prior to starting asbestos roofing removal work in compliance with OSHA Standard 1926.1101, if available. Keep the exposure assessment on site for review by all concerned parties.

END OF SECTION 070150

SECTION 073113

ASPHALT SHINGLES (ADD ALTERNATES #AS1 AND #AS3)

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 ADD ALTERNATES

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide Add Alternate pricing for the following roofing replacement options as described below:
 - 1. Add Alternate #AS1: Bus Canopy Roof
 - a. Remove the existing asphalt shingle roofing, including asphalt shingles, felt underlayment, and associated metal flashings, fascia, and built-in gutters, down to existing wood deck boards (to remain).
 - b. Provide new asphalt shingle roofing consisting of new copper flashings, self-adhered membrane underlayment at the perimeter and transitions in the roof, new felt underlayment in the field of the roof, and new asphalt shingles.
 - 2. Add Alternate #AS3: Inactive Platform Canopy Roof
 - a. Remove the existing asphalt shingle roofing, including asphalt shingles, felt underlayment, and associated metal flashings, fascia, and built-in gutters, down to existing wood deck boards (to remain).
 - b. Provide new asphalt shingle roofing consisting of new copper flashings, self-adhered membrane underlayment at the perimeter and transitions in the roof, new felt underlayment in the field of the roof, and new asphalt shingles.

c. Abate and properly dispose of the existing roofing cement identified as containing asbestos in accordance with Section 070150.23 – Asbestos-Containing Roofing Removal.

d. Remove and replace the bird netting in place below the canopy.

1.03 COORDINATE WITH RELATED WORK

A. Coordinate the work of this Section with the work of other trades under this Contract, including but not limited to:

1. Section 010290 – Bird Netting (Add Alternate #AS3).
2. Section 013000 – Submittals.
3. Section 014000 – Quality Control and Project Procedures.
4. Section 015000 – Construction Facilities and Site Use.
5. Section 016000 – Temporary Protection.
6. Section 061000 – Rough Carpentry.
7. Section 061500 – Wood Deck Boards and Soffit.
8. Section 070150.23 – Asbestos-Containing Roofing Removal (Add Alternate #AS3).
9. Section 073213 – Clay Tile Roofing.
10. Section 076000 – Sheet Metal Flashing.
11. Section 079200 – Joint Sealant.

1.04 REFERENCE STANDARDS

A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.

1. Connecticut State Building Code, current edition.
2. Secretary of the Interior's Standards for the Treatment of Historic Properties.
3. Product manufacturer's written recommendations.
4. ASTM International (ASTM): Standards as specified or referenced herein.
5. NRCA Roofing Manual: Steep-slope Roof Systems.

6. The Asphalt Roofing Manufacturers Association's *Residential Asphalt Roofing Manual*.

1.05 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.

1. Product Data:

- a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
2. Shop Drawings: Submit shop drawings of asphalt shingle roofing, including flashings, gutters and down leaders, wood blocking, and methods of attachment.
 3. Samples: Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.06 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.

1. Typical shingle installation: 100 sq ft.
2. Shingle installation at ridge: 10 LF.
3. Shingle installation at hip: 10 LF.
4. Coordinate with Section 076000 – Sheet Metal Flashing to provide a complete mockup consisting of the asphalt shingle roofing system and metal flashing at the following locations:
 - a. Eave: 5 LF

- b. Rake: 5 LF
- c. Base-of-Wall Flashing and Counterflashing: 5 LF
- d. Confined Rake at Rising Wall: 5 LF.
- e. Step Flashing at Rising Wall: Three Steps.
- f. Detail at Step in Roof: 4 sq ft.
- g. Flashing at Duct Penetration: 1 Location.

1.07 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

1.08 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least five years' successful experience on similar work on historic buildings.

1.09 WARRANTY

- A. Asphalt shingle product warranty: Provide asphalt shingle manufacturer's standard thirty-year warranty.
- B. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Asphalt Shingles: Asphalt shingles consisting of a fiber glass mat base with blended granule surfacing, algae-resistant, and meeting the requirements of ASTM D3018 Type I.
1. Thirty-year asphalt shingles. Landmark Premium by CertainTeed or equal. Color as selected by Owner.
 - a. Accessories: to match.
 - b. Ridge and Hip Caps: to match.
- B. Roofing Underlayment: synthetic, polymer-based scrim-reinforced underlayment. DiamondDeck by CertainTeed or equal.
- C. Self-Adhered Membrane Underlayment: 0.040 in. thick self-adhering rubberized asphalt membrane with integrally bonded polyethylene laminate. "Ice & Water Shield," as manufactured by GCP, or approved equal.
1. Liquid Membrane (for use below underlayment): Bituthene Liquid Membrane (LM), or equal.
 2. Primer: As recommended by the manufacturer.
 3. Termination Sealant (for use above underlayment): As recommended by manufacturer.
- D. High-Temperature, Self-Adhered Membrane Underlayment: Butyl-based, non-asphaltic self-adhering membrane, with integrally bonded polyethylene laminate, formulated for use below metal roofing or in high-temperature environments, as recommended by the manufacturer; "Grace Ultra," as manufactured by GCP.
1. Accessories Products / Primer: same as for self-adhered membrane underlayment.
- E. Fasteners: Hot-dipped galvanized 11 or 12 ga sharp pointed conventional roofing nails with barbed shanks, minimum 3/8 in. flat head and 1-1/4 in. shank. Use 2 in. long nails at ridge cap shingles. Do not use staples.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.
- B. Examine all surfaces scheduled to receive membrane underlayment for roughness, contaminants, unsound structural substrates, or other conditions that may impair the roofing application. Notify the Engineer in writing of any such conditions; do not commence work until all defects are remedied.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, site work, landscaping, and the building interior from all risks associated with the work. Protect persons, property, and site as required. Repair all damaged elements of the building caused by the work of this Section at no additional cost to the Owner.

3.03 GENERAL SHEET METAL WORKMANSHIP

- A. Refer to Section 07600 – Sheet Metal Flashing.

3.04 GENERAL WORKMANSHIP

- A. Install the asphalt-shingle roofing system in accordance with the recommendations of The Asphalt Roofing Manufacturers Association's *Residential Asphalt Roofing Manual* (latest edition) and the shingle manufacturer's printed recommendations for details and application techniques, except as modified herein.
- B. Building deck and wall surfaces must be dry, clean, and smooth. Do not work in wet conditions. Comply with applicable recommendations by the manufacturers of all materials and by the Asphalt Roofing Manufacturers Association (ARMA) for workmanship and handling except as modified herein.
- C. Remove only as much existing roofing as can be replaced and made tight the same day. When wet/damaged roof deck is exposed and is to be replaced, complete the replacement of the deck each day to provide a solid continuous roof deck (refer to Section 061500 – Wood Decking and Soffit). Weatherproof barriers are not to be used for weekend or other long-term (more than one night) covers.
- D. Do not allow wrappers and packaging materials to be included in the roofing system.
- E. Remove all tools, buckets, and materials from work areas and store neatly at a designated location at the end of each work.

- F. Install roofing and flashing systems concurrently with membrane and underlayment installation to prevent water entry at flashing locations (refer to Section 076000 – Sheet Metal Flashing). If rain threatens during the day, or in an emergency, provide temporary protection for the unfinished roofing and flashing components.
- G. Exposed roofing nails are not permitted.

3.05 INSTALLATION OF ROOFING UNDERLAYMENT

- A. Clean surfaces to receive roofing underlayment thoroughly prior to installation. Eliminate dust, dirt, loose nails, and other objects.
- B. Starting at the lower edge of the roof, cover the entire deck by applying a single layer of the roofing underlayment parallel to the eaves, with printed side facing up.
- C. At laps, overlap all ends (vertical laps) at least 6 in. and all horizontal laps at least 3 in.
- D. Offset end laps from course to course at least 3 ft.
- E. Apply roofing underlayment flat and unwrinkled, carefully fastening to hold in place.
- F. Do not use staples.
- G. Do not leave exposed for more than ninety days.

3.06 INSTALLATION OF SELF-ADHERED MEMBRANE UNDERLAYMENT

- A. Clean surfaces to receive self-adhered membrane underlayment 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.
- C. The surfaces over which the self-adhered membrane underlayment is to be installed are to be smooth and free of defects such as loose pieces, holes, uneven surface, and protruding fasteners. Report any condition to the Engineer that would interfere with proper installation of underlayment.
- D. Fill all gaps in the wood deck with liquid membrane to provide a continuous, smooth substrate.
- E. Do not apply the self-adhered membrane underlayment unless the exposed surface of the substrate is clean and dry.
- F. Remove all dirt and debris from plywood sheathing. Prime all surfaces to receive self-adhered membrane underlayment to achieve maximum adhesion. Apply primer only to the area to be covered with membrane during the current working day. Apply primer with a roller or brush at the rate of 1 gal / 250 sq ft; do not spray. Allow primer to dry tack-free before covering.

- G. Install a continuous fillet bead of liquid membrane at all changes in slope of the roof to fill in gaps in the plywood substrate and to provide a smooth, continuous substrate to receive self-adhered membrane underlayment.
- H. Apply self-adhered membrane underlayment in compliance with the printed instructions of the manufacturer, unless they are modified to be more stringent by this Section.
- I. Begin application of sheets at bottom of slope and work up the roof slope; shingle all side laps 3-1/2 in. minimum to shed water, and provide 6 in. minimum end laps.
- J. Apply sheets in the longest lengths practical; shingle side laps so that they do not buck water. Roll out sheets on primed surfaces and align them. Re-roll half of the sheet in its long direction and cut through the release paper, taking care not to cut the membrane.
- K. Roll the membrane onto primed surfaces, pulling the release paper in front of the roll so that once the release paper is removed, the membrane is immediately set onto the surface. Place sheets without fishmouths or wrinkles. Do not stretch the membrane.
- L. If fishmouths and wrinkles appear, cut out and flatten the affected area and cover it with membrane extending at least 6 in. beyond the cut on all sides.
- M. Immediately after applying the membrane sheet, hand-press it into contact with the surface and roll the entire membrane towards lap seams with a handheld neoprene roller. Remove air pockets and patch in accordance with the manufacturer's recommendations. Create a uniform and complete bond.
- N. Re-prime areas that become dirty or debris-covered during the course of the work prior to installing membrane.
- O. Seal all exposed perimeter edges at temporary tie-ins with specified mastic each day and remove mastic before applying additional membrane.

3.07 ASPHALT SHINGLE INSTALLATION

- A. Begin shingles with a starter strip of cut shingles with the lower 5 in. tab portion removed. Attach the starter strip with the adhesive side up at the eave edge. Overhang the metal eave and rake-trim drip edge by 3/8 to 1/2 in. and offset butt joints in succeeding course. Locate starter course fasteners approximately 2 in. from the eave edge, making certain that fasteners sink into the roof sheathing.
- B. Snap horizontal and vertical caulk lines to ensure proper alignment and 5-7/8 in. exposure. Stagger butt joints in succeeding courses diagonally (stepped-off diagonal method); do not apply staggered joints in a straight-up manner (racking method).
- C. Fasten each shingle and starter with four nails per shingle through the nailing line. The fastener should penetrate both overlay and underlay portions of the shingle. Locate fasteners as indicated in the manufacturer's installation instructions.

- D. Remove release tape prior to installing subsequent shingles and press shingles into adhesive.

3.08 CLEANUP

- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 073213

CLAY TILE ROOFING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following roofing repairs at Roof CT1 as described below:
 - 1. Remove the existing clay tile roofing at the locations shown on the drawings, including at the perimeter of the roof, at and around the roof dormers, and at roof penetrations. Remove existing roofing down to plywood roof sheathing (to remain). Remove the clay roof tiles, felt protection layer, and metal flashings. Salvage the existing, undamaged, clay roof tiles for reinstallation.
 - 2. Provide new self-adhered membrane underlayment at the perimeter of the roof, at and around dormers, and at roof penetrations, as shown on the Drawings. Integrate self-adhered membrane underlayment with existing felt underlayment to remain.
 - 3. Provide new felt protection layer above all areas of new self-adhered membrane underlayment.
 - 4. Provide new copper flashing at the clay tile roofing, including copper cladding at dormer side walls, step flashing at rising walls (at dormers and rakes), ridge flashing, pipe penetration flashing, flashing at dormer roofs, and eave flashing. Integrate metal flashing with the new self-adhered membrane underlayment.

5. Reinstall existing clay roof tiles; replace damaged roof tiles in-kind.
 6. Remove and reinstall the existing snow fence base plates at the south wing east elevation at areas of roofing repairs. Remove mounting brackets and rails at all snow fence at the south wing east elevation and provide new mounting brackets and rails installed at existing base plates and supports.
 7. Provide new snow cleats at the north wing east elevation, and at the west elevation of the north and south wings in the areas of roofing repairs.
- D. On a Unit-Price Basis, undertake the following types of localized roofing repairs at Roof CT1, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
1. Replace individual loose, missing, or damaged clay roof tiles in the field of the roof (not including roof tiles damaged from removal).

1.03 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to:
1. Section 013000 – Submittals.
 2. Section 014000 – Quality Control and Project Procedures.
 3. Section 015000 – Construction Facilities and Site Use.
 4. Section 016000 – Temporary Protection.
 5. Section 061000 – Rough Carpentry.
 6. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
 7. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
 8. Section 076000 – Sheet Metal Flashing.
 9. Section 079200 – Joint Sealant.

1.04 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
1. Connecticut State Building Code, current edition.
 2. Secretary of the Interior's Standards for the Treatment of Historic Properties.

3. Product manufacturer's written recommendations.
4. ASTM International (ASTM): Standards as specified or referenced herein.
5. ANSI/SPRI ES-1.
6. NRCA Roofing Manual: Steep-slope Roof Systems.

1.05 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 2. Shop Drawings: Submit shop drawings of clay tile roofing showing detailing including terminations, intersections, and integration of clay tile roofing system with work included in other sections, including, but not limited to, sheet metal flashing, PVC roofing, snow cleats and snow fences, masonry at rising walls, and dormers.
 3. Existing Conditions Surveys: Submit roof plans documenting the condition of the existing roofing and identifying existing damaged clay roof tile, as required in Para. 1.07 below.
 4. Samples: Provide the following samples:
 - a. Replacement clay roof tile, full size, number of samples as needed to be representative of range of color and/or finish but not less than three samples.
 - b. Snow cleats, full size, provide a minimum of three samples.
 - c. Replacement snow fence rails, full size, 12 in. long, three samples.
 - d. Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.06 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.
1. Tie-in of New Roofing to Existing Roofing: 5 LF.
 2. Replacement of Individual Clay Tile: One location.
 3. Installation of Snow Cleat: One location.
 4. Installation of Snow Fence Base: One location.
 5. Installation of Snow Fence Rails: Three rails, 10 LF.
 6. Coordinate with Section 076000 – Sheet Metal Flashing to provide a complete mockup consisting of the clay tile roofing system and metal flashing at the following locations:
 - a. Main Roof Eave: 10 LF.
 - b. Dormer Roof Eave: 5 LF.
 - c. Ridge: 10 LF.
 - d. Sill at Dormer Window: One location.
 - e. Base of Wall at Turrets: Five flashing steps.
 - f. Base of Wall at Gables: 5 LF.
 - g. Dormer Side Wall: One location.

1.07 FIELD SURVEY

- A. Survey the existing conditions and submit roof plans indicating existing construction and conditions:
1. Survey of Existing Clay Tile Roofs to be Replaced: Field measure the existing clay tile roofing to determine the exposure and layout of the roof tiles in all areas where the clay tile roofing is to be replaced. Adjust clay tile width layout slightly, as necessary, to provide only whole- and half-width roof tiles at all rakes, as indicated on the Drawings.
 2. Survey of Existing Clay Tile Roofs to Remain: Survey the existing clay tile roofs to remain to identify all individual cracked, broken, loose, or missing clay tile. Provide annotated roof plan locating each clay roof tile scheduled for

replacement. Approval of survey drawing required before individual clay roof tile replacement can begin.

1.08 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.
- B. Remove, store, and reinstall the existing clay roof tiles in areas identified on the Drawings where the existing clay tile roof is to remain to facilitate repair or replacement of other roof components, including areas adjacent to chimneys, skylights, flat roofs, gutters, and other roof components as necessary for repair or replacement of such components. Assume 5% replacement of the existing clay roof tiles due to damage and breakage during removal.

1.09 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least five years' successful experience on similar work on historic buildings.

1.10 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Clay Roof Tiles: Salvage and re-use existing wherever possible.
- B. Replacement Clay Roof Tiles: ASTM C 1167, molded- or extruded-clay roof tile units of shape and configuration indicated, kiln fired, and free of surface imperfections. Provide with fastening holes pre-punched at factory before firing.
 - 1. Durability: Grade 1.
 - 2. Shape: High-profile to match existing; Type 1, Spanish or "S."
 - a. Accessory Tiles: Shapes as required to match existing.
 - 3. Finish and Texture: Match existing. If required, provide matte-finished glaze tile.
 - 4. Color: Terra-cotta, with a uniform color, to match existing.
 - 5. Send samples of existing tiles to manufacturer so that they can identify color and texture, and provide standard products or custom matches as required.
 - 6. Hooks for reinstalling individual clay tile: Made from 1/8 in. thick by 1 in. wide brass or bronze bar stock.
- C. Felt Protection Layer: 30 lb unperforated, asphalt-saturated felt, ASTM D226, Type II.
- D. Self-adhered Membrane Underlayment: 0.040 in. thick self-adhering rubberized asphalt membrane with integrally bonded polyethylene laminate. "Ice & Water Shield," as manufactured by GCP, or approved equal.
- E. High-temperature, Self-Adhered Membrane Underlayment: Butyl-based, non-asphaltic self-adhering membrane, with integrally bonded polyethylene laminate, formulated for use below metal roofing or in high-temperature environments, as recommended by the manufacturer; "Grace Ultra," as manufactured by GCP, or approved equal.
- F. Self-Adhered Membrane Underlayment Accessories:
 - 1. Liquid Membrane (for use below underlayment): Bituthene Liquid Membrane.
 - 2. Primer: As recommended by the manufacturer.
 - 3. Termination Sealant (for use above underlayment): As recommended by manufacturer.
- G. Sheet metal flashing and associated materials: Refer to Section 076000.
- H. Fasteners:

1. For Attaching to Masonry or Concrete: Screws acceptable for use in masonry, 1/4 in. dia. by 1-1/4 in. embedment, hex-head screws. Tapcon by Buildex, or approved equal. Predrill holes with drill bits required by manufacturer.
 2. For Attaching to Wood, Plywood, or Nailable Gypsum Roof Plank: 12 ga copper nails, with minimum 1/4 in. dia. flat head, annular threaded, with needle point, and of sufficient length to obtain 1-1/4 in. embedment into wood blocking, or full depth into plywood.
- I. Roofer's Cement: Red roofer's cement, heavy-duty, non-sagging, asphaltic-based mastic meeting the requirements of ASTM D4586, trowel-grade cement, for use in concealed locations only.
- J. Snow Cleats: Preformed snow cleats made of brass or bronze bar, size and shape to match existing.
- K. Snow Fence: Three-rail snow fence.
1. Base Plates: Reuse existing metal base plates.
 2. Mounting Brackets: Provide new brass or bronze three-rail mounting brackets with decorative shape appropriate for the historic character of the building.
 3. Rails: provide new brass or bronze continuous round rails, including couplers, sizes to fit mounting brackets.
 4. Fasteners:
 - a. For use to attach base plates: Stainless steel wood screw with countersunk head, length as required to engage full depth of wood blocking (assume 2 in.)
 - b. To secure mounting brackets: Brass or bronze nuts, washers, and bolts, size as required by existing base plates and new mounting brackets.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.
- B. Examine all surfaces scheduled to receive membrane underlayment for roughness, contaminants, unsound structural substrates, or other conditions that may impair the

roofing application. Notify the Engineer in writing of any such conditions; do not commence work until all defects are remedied.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, site work, landscaping, and the building interior from all risks associated with the work. Protect persons, property, and site as required. Repair all damaged elements of the building caused by the work of this Section at no additional cost to the Owner.

3.03 GENERAL SHEET METAL WORKMANSHIP

- A. Refer to Section 07600 – Sheet Metal Flashing.

3.04 REMOVAL OF EXISTING CLAY TILE ROOFING

- A. In areas of removal, remove existing clay roof tiles, underlayments, and metal flashing down to the plywood sheathing (to remain where in sound condition or replaced in accordance with Section 061000 – Rough Carpentry).
 - 1. Leave enough of the existing underlayment in place to achieve required lap between the new and existing underlayment.
 - 2. Store clay tile in a dry, clean area. Protect for reinstallation.
 - 3. Dispose of other materials not to be reused.
- B. Remove all existing nails used to secure existing clay roof tiles and flashing to provide a smooth and clean roof substrate. Do not pound nails in.
- C. Do not remove more clay roof tiles than can be replaced with new clay roof tiles within two weeks.

3.05 REPAIR OF SUBSTRATE

- A. Refer to Section 061000 – Rough Carpentry

3.06 INSTALLATION OF SELF-ADHERED MEMBRANE UNDERLAYMENT

- A. Clean surfaces to receive self-adhered membrane underlayment 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.
- C. The surfaces over which the self-adhered membrane underlayment is to be installed are to be smooth and free of defects such as loose pieces, holes, uneven surface, and protruding fasteners. Report any condition to the Engineer that would interfere with proper installation of underlayment.

- D. Do not apply the self-adhered membrane underlayment unless the exposed surface of the substrate is clean and dry.
- E. Remove all dirt and debris from plywood sheathing. Prime all surfaces to receive self-adhered membrane underlayment to achieve maximum adhesion. Apply primer only to the area to be covered with membrane during the current working day. Apply primer with a roller or brush at the rate of 1 gal / 250 sq ft; do not spray. Allow primer to dry tack-free before covering.
- F. Install a continuous fillet bead of liquid membrane at all changes in slope of the roof to fill in gaps in the plywood substrate and to provide a smooth, continuous substrate to receive self-adhered membrane underlayment.
- G. Apply self-adhered membrane underlayment in compliance with the printed instructions of the manufacturer, unless they are modified to be more stringent by this Section.
- H. Begin application of sheets at bottom of slope and work up the roof slope; shingle all side laps 3-1/2 in. minimum to shed water, and provide 6 in. minimum end laps.
- I. Apply sheets in the longest lengths practical; shingle side laps so that they do not buck water. Roll out sheets on primed surfaces and align them. Re-roll half of the sheet in its long direction and cut through the release paper, taking care not to cut the membrane.
- J. Roll the membrane onto primed surfaces, pulling the release paper in front of the roll so that once the release paper is removed, the membrane is immediately set onto the surface. Place sheets without fishmouths or wrinkles. Do not stretch the membrane.
- K. If fishmouths and wrinkles appear, cut out and flatten the affected area and cover it with membrane extending at least 6 in. beyond the cut on all sides.
- L. Immediately after applying the membrane sheet, hand-press it into contact with the surface and roll the entire membrane towards lap seams with a handheld neoprene roller. Remove air pockets and patch in accordance with the manufacturer's recommendations. Create a uniform and complete bond.
- M. Re-prime areas that become dirty or debris-covered during the course of the work prior to installing membrane.
- N. Seal all exposed perimeter edges at temporary tie-ins with specified mastic each day and remove mastic before applying additional membrane.

3.07 INSTALLATION OF FELT PROTECTION LAYER

- A. Apply felt protection layer in compliance with the printed instructions of the manufacturer, unless they are modified by this Section.
- B. Apply felt protection layer in the longest lengths practicable to minimize laps and seams. Secure to the roof deck using approved fasteners. Lap felt at least 2 in. to

shed water off top laps and at least 6 in. at end laps. Use only enough fasteners to hold the felt in place prior to installing clay roof tiles. Repair any holes or tears in felt protection layer with roofing cement and felt.

- C. Apply felt protection layer flat with no wrinkles or ridges. Replace all wrinkled, ridged, torn, or damaged felts at no cost to the Owner.

3.08 INSTALLATION OF CLAY ROOF TILES

- A. Working from the approved clay roof tile layout submittal, lay out all courses of clay roof tiles on the protection layer by snapping lines. Install roofing tiles in strict accordance with industry practice and recommendations. The most restrictive practices and recommendations shall govern.
- B. Inspect each clay roof tile prior to installing to ensure that the tiles are sound, without cracks, chips, or other damage. Inspect each clay tile for cracks, large chips (greater than 1 sq in.), or any other indications of damage. Remove from the site any clay tile that is cracked, chipped, or otherwise damaged. Broken corners on exposed ends are prohibited.
- C. Install clay roof tile as shown on the approved shop drawings. Match the size and coursing of clay roof tile on the existing roofs as documented on the approved layout plans.
- D. Nail clay roof tiles with two nails each. Drive nails as shown on the Drawings, so clay roof tiles "hang" on the nail shank, without the underside of the nail head applying pressure to the clay roof tile. Do not install with nail heads raised. Exposed nails are not acceptable. If exposed nail heads are unavoidable at the top of a dormer side wall or elsewhere, cover the nail head with a dab of roofer's cement.
- E. At rake edges, set edge roof tiles in roofer's cement and fill voids at exposed clay roof tile edges.
- F. Fit clay roof tiles neatly around dormers and other changes in geometry in the roof.
- G. Upon completion of clay roof tile installation, roof tiles shall be sound, whole, properly attached, configured to shed water, and clean.
- H. At the conclusion of the Work, provide the owner with attic stock consisting of 100 clay roof tiles used on the project. Neatly stack, crate, and label roof tiles and store it in a location in the building directed as by the Owner.

3.09 INDIVIDUAL CLAY ROOF TILE REPLACEMENT

- A. Inspect existing clay tile roofing to remain in areas indicated on the Drawings. Remove and replace all clay roof tiles that are loose, broken, or missing as identified on the approved survey. Remove clay roof tiles by cutting the existing copper nails with a slater's ripping bar.

- B. Install replacement clay roof tiles using two copper hooks, and as indicated on the Drawings.
- C. Areas of excessive breakage or defects shall be completely removed and replaced, as required by the Engineer.
- D. If any shingles are damaged or broken during the work, remove and replace them as described in this section at no additional cost to the Owner.

3.10 INSTALLATION OF SNOW CLEATS AND SNOW FENCE COMPONENTS

- A. Proceed with reinstallation of snow cleats and snow fence base plates concurrently with clay roof tile installation, so as to provide watertight connections to the roofing system.
- B. Install snow cleats in the pattern to match existing and as approved in the shop drawings. Locate the snow cleats below the low-profile portion of the clay roof tile at the course above. Install the cleats so that the protruding portion is located about 3/4 in. below the bottom edge of the clay roof tile of the course above.
- C. Spacing of snow fence base plates to match existing and as needed to align with metal roof trusses below. Secure snow fence base plates to the metal roof trusses; do NOT attach only to wood sheathing and/or gypsum roof plank.
- D. Install snow fences parallel to the eave with the rails oriented perpendicular to the slope of the roof.
- E. Hold snow fence rails back from vertical walls approximately 8 in.

3.11 CLEANUP

- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 075419

POLYVINYL CHLORIDE (PVC) ROOFING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY: BASE BID

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following roofing replacement as described below at each roof location:
 - 1. Roof LS1: Low-Slope Roof at Center Wing
 - a. Remove the existing ballasted EPDM roofing system including: stone ballast, EPDM membrane (note that two layers are present in some locations), and insulation, down to the existing lightweight concrete topping (to remain).
 - b. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing gypsum plank and lightweight concrete topping, adhered vapor retarder membrane, insulation including tapered insulation to provide slope-to-drain, fastened to the gypsum deck, cover board adhered to insulation, PVC roofing membrane adhered with heat-welded seams. Provide PVC flashing membrane at roof penetrations.
 - c. Provide roof walkway pads at locations shown on the Drawings.
 - d. Remove and replace the existing clamping rings, and strainers; existing drain bowls to remain (eight total).

- e. Cut and remove the existing masonry at parapets as needed to provide new scupper drains at locations shown on the Drawings (six total). Provide new scupper drains through the masonry parapets at locations shown on the Drawings (six total). Provide PVC-clad sheet metal liner at new scupper drains, integrated with the new roofing system, as shown in the Drawings.
 - f. Provide membrane liner at cracked drain leader pipe, at location (one total) indicated in the Drawings.
 - g. Remove and reinstall the existing roof hatch.
 - h. Decommission roof-mounted equipment where needed to relocate equipment onto new curbs, extend wiring and ductwork, and recommission equipment. Verify equipment is fully functional before decommission and after recommission.
 - i. Remove and dispose of existing abandoned roof curbs and penetrations where indicated on the drawings and where directed in the field by the Engineer.
 - j. Remove, store, and reinstall existing cameras mounted on the parapets. Coordinate with Propark prior to removal.
2. Roof LS2: Low-Slope Roof at South Addition
- a. Remove the existing flat-seam copper roofing including flat-seam copper roofing and flashing, and felt underlayment, down to the existing wood deck boards (to remain).
 - b. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing wood deck boards, plywood roof sheathing fastened to the existing wood roof deck (provided in Section 061000 – Rough Carpentry), adhered vapor retarder membrane, insulation fastened to the plywood, cover board adhered to the insulation, PVC roofing membrane adhered with heat-welded seams. Provide PVC flashing membrane at roof penetrations. Provide custom-color PVC membrane.
 - c. Provide roof walkway pads (standard color) at locations indicated on the Drawings.
 - d. Remove and replace the existing clamping rings, and strainers; existing drain bowls to remain (two total).

1.03 ADD ALTERNATES

- A. Provide the Project Mobilization and General Requirements as described above.

- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide Add Alternate pricing for the following roofing replacement options as described below:
 - 1. Add Alternate #LS2: Omit work described above in Para. 1.02-C-2-b and 1.02-C-2-c.
 - 2. Add Alternate #LS3: Low-Slope Roof at Center Wing Entrance Canopy
 - a. Remove the existing EPDM roofing system, including EPDM membrane and insulation down to the existing plywood roof deck (to remain).
 - b. Provide new PVC membrane roofing system consisting of (from bottom to top): Existing plywood roof deck, adhered vapor retarder membrane, tapered insulation to provide slope to drain fastened to plywood, cover board adhered, PVC roofing membrane adhered with heat-welded seams.

1.04 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including but not limited to:
 - 1. Section 013000 – Submittals.
 - 2. Section 014000 – Quality Control and Project Procedures.
 - 3. Section 015000 – Construction Facilities and Site Use.
 - 4. Section 016000 – Temporary Protection.
 - 5. Section 035300 – Concrete Topping Repair.
 - 6. Section 061000 – Rough Carpentry.
 - 7. Section 061500 – Wood Deck Boards and Soffit.
 - 8. Section 073213 – Clay Tile Roofing.
 - 9. Section 076000 – Sheet Metal Flashing.
 - 10. Section 076100 – Copper Roofing.
 - 11. Section 079200 – Joint Sealant.

1.05 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
1. Connecticut State Building Code, current edition.
 2. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 3. Product manufacturer's written recommendations.
 4. ASTM International (ASTM): Standards as specified or referenced herein.
 5. FM Global Applicable Publications (most current versions), including, but not limited to:
 - a. FM Data Sheet 1-49 Perimeter Flashing.
 - b. FM Data Sheet 1-28 Design Wind Loads.
 - c. FM Data Sheet 1-29 Roof Deck Securement and Above-Deck Roof Components.
 - d. FM Data Sheet 1-52 Field Verification of Roof Wind Uplift Resistance.
 6. National Roofing Contractors Association (NRCA): NRCA Roofing Manual, current edition.

1.06 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.

2. Existing Conditions Survey: Perform a survey of the existing roof deck at LS1 to measure the relative high and low points of the existing roof deck. Take measurements in general in a 10 ft by 10 ft grid with additional measurements taken at areas of unusual geometry or where localized high or low points are apparent.
3. Shop Drawings: Provide shop drawings consisting of roof plans and details as follows:
 - a. Provide a roof plan showing the tapered insulation layout including roof slope, sumps around drains, and note associated flashing heights. Roof plan must also show roof drains and scupper locations.
 - b. Provide details of all PVC flashing showing exact profile, lengths, joints, terminations, and methods of attachment.
 - c. Show proposed layout of walkway pads.
 - d. Coordinate with other trades to show the work from other trades on the roofing shop drawings (e.g., sheet metal, rough carpentry, etc.).
4. Samples: Provide the following samples:
 - a. Custom-colored PVC membrane proposed for use at Roof LS2; 4 SF minimum.
 - b. Of the materials specified herein or proposed for use in this project at the request of the Engineer.
5. Results of fastener pull-out tests for mechanical attachment into gypsum plank deck. Submit results for a minimum of ten (10) fastener pull tests.
6. Cover Board Weigh-Down Plan: Submit proposed methods (i.e., plan) for weighing down insulation boards into foam adhesive during installation. Plan shall note type and frequency of weights to be utilized on each standard size board for the project. Buckets of adhesive and rolls of stock shall not be utilized as hold-down weights, as contents of buckets can be removed and rolls of stock depleted, thus providing diminishing hold-down capacity as the work progresses. Weights shall be products/materials that are not intended to be incorporated into the roofing system.
7. Copy of installer's warranty as described herein.
8. Copy of manufacturer's warranty as described herein.

1.07 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with

any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.

1. Roofing system, 100 SF.
2. Roofing integration with parapet flashing (LS1), 4 LF.
3. Roof integration with the rising walls, 4 LF at LS2 (omit if Add Alternate #LS2 is selected), and 4 LF at LS3.
4. Drain flashing, one location at LS1 and one location at LS3.
5. Scupper drain (LS1), one location.
6. Steel Dunnage Penetration (LS1), one location.
7. Gutter flashing, 4 LF (Omit if Add Alternate LS2 is selected).
8. Pipe penetration flashing (LS1), one location.
9. Roof curb (LS1), 4 LF.
10. Walkway Pad, one location at LS1 and one location at LS2 (omit if Add Alternate #LS2 is selected).
11. Roof Diverter (LS2), 4 LF (omit if Add Alternate #LS2 is selected).
12. Coordinate with Sections 061000 – Rough Carpentry and 076000 – Sheet Metal Flashing to provide complete mockups at the locations described herein.

1.08 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

1.09 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least 5 years' successful experience on similar work on historic buildings.
- C. Manufacturer's Field Representative: The Contractor shall arrange with the roofing manufacturer to have the services of a competent field representative at the site to approve surface preparation before installation of roofing materials and to be present

to periodically observe the work in progress. The contractor shall coordinate with the roofing manufacturer to arrange as many site visits as required by the manufacturer for their warranty requirements. During site visits, the Field Representative shall instruct the crew on proper installation of materials and observe the installation of the roofing membrane. The Field Representative shall issue written reports of his/her findings and recommendations to the Owner and Engineer.

1.10 FIELD TESTING

- A. Conduct (or arrange for) fastener pull-out tests to be performed on fasteners installed in the existing gypsum plank roof deck and new and existing plywood sheathing. Submit the results of the fastener pull-out tests to the Engineer for approval in advance of the work for each roof. Conduct a minimum of ten (10) tests on each fastener type proposed for use on the project on each roof. Make all necessary temporary openings and repairs needed to perform the tests.
- B. Weld Tests: Cut out and patch seam weld tests daily, or more frequently if required by the manufacturer or if requested by the Engineer.
 - 1. Make test cuts 1 in. wide and longer than the width of the seam.
 - 2. Allow the sample to cool for about 30 min., peel the sample apart, and examine the weld. The membrane should delaminate from the reinforcement. Machine welds shall be 1-1/2 in. wide; hand welds 2 in. wide.
 - 3. If the samples do not meet the width minimum requirements or are deficient, the contractor must strip in ALL seams in the workday affected by the deficient welds.
 - 4. Repair test-cut areas with membrane overlay with rounded corners and 2 in. hand-welded seam.

1.11 PERFORMANCE REQUIREMENTS

- A. The roofing system, in combination with adjacent construction, shall provide a fully-watertight system.
- B. Design is in accordance with the Connecticut State Building Code, Current Edition, and must resist wind-uplift loads equal or greater than the following, with a factor of safety of 2 or greater:
 - 1. Roof LS1:
 - a. Zone 1 (Field Wind Uplift Zone of Roof): 34 psf
 - b. Zone 2 (Perimeter Wind Uplift Zone of Roof): 56 psf
 - c. Zone 3 (Corner Wind Uplift Zone of Roof): 85 psf
 - 2. Roof LS2:

- a. Zone 1 (Field Wind Uplift Zone of Roof): 26 psf
 - b. Zone 2 (Perimeter Wind Uplift Zone of Roof): 45 psf
 - c. Zone 2 OH (Perimeter Wind Uplift Zone of Roof at Overhang): 57 psf
 - d. Zone 3 (Corner Wind Uplift Zone of Roof): 66 psf
 - e. Zone 3 OH (Corner Wind Uplift Zone of Roof at Overhang): 93 psf
3. Roof LS3:
- a. Zone 1 (Field Wind Uplift Zone of Roof): N/A
 - b. Zone 2 (Perimeter Wind Uplift Zone of Roof): N/A
 - c. Zone 3 (Corner Wind Uplift Zone of Roof): 67 psf

1.12 WARRANTY

- A. Provide the roofing system manufacturer's twenty year warranty on all labor and materials on the roofing system as part of the Pricing Set. The roof warranty shall cover wind speeds up to and including 60 mph.
- B. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Provide PVC roofing system as manufactured and provided by Sika Sarnafil; no substitutions. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. PVC sheet roofing system and all associated flashings and accessories are to be produced by Sika Sarnafil, no exceptions, as required to be eligible for the manufacturer's warranty and to meet the specified wind-uplift-resistance requirements.
 1. Vapor Retarder/Temporary Roof: Self-adhered sheet vapor retarder, 32 mil thick, composed of SBS-modified bitumen and polyethylene woven composite

- facers, Sarnavap-Self Adhered with 0.017 perm. Provide two layers with staggered joints.
- a. Primer for Vapor Retarder/Temporary Roof: Solvent-based primer for use on concrete and wood decks, Sarnavap self-adhered primer by Sika Sarnafil.
2. PVC Roofing Membrane: Virgin PVC with plasticizers and other modifiers, formed into flexible sheets with nonwoven polyester reinforcing conforming to ASTM D4434, Type III, Sarnafil G410 with lacquer coating, 60 mils thick; color to be light gray.
 - a. Adhesive: Solvent-based, VOC-compliant, elastomeric adhesive, Sarnacol 2170 VC Adhesive.
 3. PVC Flashing Sheet: Glass-fiber-reinforced PVC, asphalt-resistant membrane, Sarnafil G459; color to be light gray except where custom-colored membrane is required at Roof LS2.
 4. Accessories:
 - a. Circular Membrane Patch for Use at T-joints: Sanacircle – “G,” 0.048 in. thickness by Sika Sarnafil.
 - b. PVC Prefabricated Boot Flashing: By Sika Sarnafil
 - c. PVC Prefabricated Corner Reinforcements: Sarnacorner Universal by Sika Sarnafil.
 - d. Batten Bars: Sarnastop by Sarnafil.
 - e. Termination Bar: 14 ga stainless steel metal bar, 1 in. wide, prepunched bar stock, Sarnabar by Sarnafil.
 - f. PVC Cord: 5/32 in. diameter PVC cord for use at the termination bars, Sarnacord PVC by Sarnafil.
 - g. Waterstop: One-part urethane, Sikaflex 1A, by Sika Sarnafil.
 - h. Membrane Cleaner: As recommended by Sika Sarnafil for cleaning surface of PVC membrane at area of hot-air welds.
- B. PVC-Clad Metal Flashing: PVC-coated heat-weldable sheet metal, Sarnaclad, 24 ga, stainless steel metal sheet with a 20 mil (0.5 mm) Sarnafil membrane laminated on one side.
 - C. Insulation: Rigid glass-fiber-faced isocyanurate foam insulation boards. Do not use boards more than 2 in. thick. Minimum compressive strength of 25 psi. Thickness as required to provide a minimum R value of R-30.

- D. Tapered Edge Strips: 1-5/8 in. x 18 in. wedge-type fiberboard insulation, ASTM C208, surface sized.
- E. Tapered Insulation: Isocyanurate insulation with fiberglass-reinforced facers. Minimum compressive strength of 25 psi, tapered at 1/4 in. per ft.
- F. Cover Board: high-density polyisocyanurate roof board. Sarnatherm Roof Board H or approved equal.
 - 1. Adhesive: Two-component foamable polyurethane board adhesive, Sarnacol OM Board Adhesive.
- G. Stress Plate for Anchoring Insulation and Cover Board to Roof Deck: Sarnaplate – HD/CD by Sarnafil.
 - 1. Fasteners for Concrete and Wood Decks: Sarnafastener – HD, length as required to ensure minimum 1 in. embedment into the existing lightweight concrete deck and full depth into plywood.
- H. Fasteners (for attaching to wood blocking): Stainless steel annular ring nails in gauges as detailed or required, with length to provide a minimum of 1-1/4 in. embedment into the final piece receiving the nail points, except full depth into plywood.
- I. Batt Insulation (at existing voids such as pipe penetrations, drain bowls, etc.): Mineral wool, Comfortbatt by Rockwool or approved equal.
- J. Walkway Pads: PVC walkway pads 1/4 in. thick with raised nibs provided by roofing system manufacturer.
- K. Hose Clamp: Stainless steel with worm drive, sized to fit penetration.
- L. Sealant: Sealant recommended by Sika Sarnafil for use with PVC roofing system.
- M. Drain liner: Epoxy pipe lining, applied as a fluid that hardens for form a continuous watertight solid liner; acceptable for use with cast iron pipes of storm drainage system, thickness to not exceed 7% of inner diameter of the pipe.
- N. Sealant for setting PVC sleeve at scupper drains: One-part polyurethane sealant designed to be used compression-type seal and compatible with PVC membrane: Sikaflex-1a by Sika.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in

- the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.
- B. Examine all surfaces scheduled to receive membrane underlayment for roughness, contaminants, unsound structural substrates, or other conditions that may impair the roofing application. Notify the Engineer in writing of any such conditions; do not commence work until all defects are remedied.
 - C. Perform demolition and preparation work carefully to avoid damage to the roof decks and flashing substrates.
 - D. Roof deck surface must be dry, clean, smooth, and intact. Do not start work until the deck surface and blocking are satisfactory for the roof installation.
 - E. Inspect existing roof deck for damage.
 - 1. Coordinate with Specification Section 035300 – Concrete Topping Repair to repair areas of deteriorated concrete deck.
 - 2. Coordinate with Specification Section 061500 – Wood Deck Boards and Soffit to repair areas of deteriorated wood deck.
 - F. Verify that all existing roof drain lines are unblocked before starting work and report blockages to the Engineer in writing.
 - G. Perform repairs to cracked drain leader prior to starting roofing work.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, site work, landscaping, and the building interior from all risks associated with the work. Protect persons, property, and site as required. Repair all damaged elements of the building caused by the work of this Section at no additional cost to the Owner.

3.03 GENERAL WORKMANSHIP

- A. The roofing system and workmanship shall be in accordance with the roofing system manufacturer's most-recent recommendations and specifications and shall be in accordance with the recommendations of the NRCA Roofing and Waterproofing Handbook, latest edition, except as modified herein.
- B. Remove only as much of the existing roofing as can be replaced and made watertight during the same workday. Dispose of all rubbish in a legal manner off the site. Conduct debris to trucks or approved containers on the ground; do not throw debris from the roof. Use specific locations approved by the Owner for debris collection. Do not block building access at collection locations. Do not stockpile material on the roof.
- C. If any unusual condition (such as deteriorated deck) is discovered, stop work and promptly report this finding to the Engineer.

- D. Cover all exposed insulation each day and arrange work so that materials are not exposed to moisture at any time. Temporarily seal all edges of sheets not completed to the existing work daily. If asphaltic materials are used, completely remove these temporary connections before continuing with the work. At no time shall asphaltic materials be in contact with any PVC materials of permanent installation.
- E. Upon completion of the work, arrange for the manufacturer to inspect the work; provide written report of their findings.
- F. Allow deck surface to dry; if necessary, dry deck surface by artificial means approved in advance by the Engineer. Use electric dryers, portable blowers, or compressed air, but no open-flame dryers.
- G. Sweep deck clean of all debris and foreign matter.
- H. Maintain roof temporary seals (tie-offs) throughout the course of the work. All seams shall be heat-welded before leaving the jobsite that day. Replace damaged or wet new roofing or insulation at no additional cost to the Owner. If water infiltrates under the new roof membrane, the membrane and insulation will be considered damaged.
- I. Do not work in temperatures below 40°F, unless specifically allowed by the Engineer. Comply with applicable recommendations by manufacturers of all materials for workmanship and handling, except as modified in this Section.
- J. Apply all components of the roofing assembly in a single working day, including insulation, membranes, and flashing. Phasing of roofing in any form is not permitted.
- K. Do not allow wrappers and packaging materials to be included in the roofing system.
- L. Avoid exposure of any roofing components to rain, dew, or water of any kind. If rain threatens during the day, in an emergency, and at the end of each day, protect the unfinished exposed roofing and flashing components using water cutoffs at all open edges. Install cutoffs from the new roofing to the deck and to the adjacent existing roofing. Remove cutoffs completely, before proceeding with subsequent work.
- M. Keep a full fire extinguisher within reach during all roofing operations. Keep only full fire extinguishers on site; promptly remove discharged or partially-full extinguishers.
- N. Ensure that all workmen and all others that walk on roofing wear clean soft-soled shoes so as not to damage materials. Use equipment that has no sharp edges and is clean and free of any asphaltic and coal-tar products.
- O. Lay out work to minimize construction traffic over installed materials.
- P. Comply with all location clean air laws and regulations.

3.04 INSTALLATION OF VAPOR RETARDER

- A. Install approved vapor retarder over prepared roof deck in accordance with the manufacturer's recommendations, and as determined by successful adhesion test, in locations indicated on the Drawings.
- B. Prepare the concrete or wood deck and conduct successful nondestructive concrete or wood moisture tests as required prior to installation. Provide smooth transitions and eliminate loose materials and sharp protrusions. Broom deck surface clean. Remove dust and debris.
- C. Install primer on clean, dry deck. Shake well before using. Apply with a brush, roller, or sprayer. Apply at manufacturer's recommended rate for the substrate. Allow primer to dry prior to installing vapor retarder. Do not use primer at membrane laps.
- D. Vapor retarder must be installed over primer on the same day.
- E. Begin vapor retarder installation at the drains and work toward the perimeter of the roof.
- F. Lap all edges of the vapor retarder 4 in. minimum and all ends 6 in. minimum. Stagger joints minimum 12 in.
- G. Install vapor retarder to achieve bond with the substrate. Roll all air bubbles out from the membrane.
- H. Repair tears, voids, and lapped seams in vapor retarder not complying with requirements. Slit and flatten all fishmouths and any blisters greater than 1 in. in diameter. Patch with sheet of vapor retarder extending 6 in. beyond repaired areas in all directions.
- I. Turn up vapor retarder a minimum of 3 in. at all penetrations and walls as shown on the Drawings.

3.05 INSTALLATION OF INSULATION AND COVER BOARD

- A. Install all insulation and cover board to achieve complete and permanent attachment between all insulation surfaces, the structural roof deck, and the roofing system.
- B. Fasten insulation with approved fasteners at spacing recommended by the manufacturer to resist the specified wind-uplift loads, and as required based on results of fastener pull-out testing. For installation into gypsum plank deck, drill pilot holes through insulation and into deck 1/2 in. deeper than required embedment. Use care not to overdrive fastener and cause damage to insulation when installing fastener.
 - 1. Roof LS1
 - a. Field Wind Uplift Zone: Minimum of 8 fasteners per 4 ft x 8 ft board.

- b. Perimeter Wind Uplift Zone: Minimum of 8 fasteners per 4 ft x 8 ft board.
 - c. Corner Wind Uplift Zone: Minimum of 11 fasteners per 4 ft x 8 ft board.
 - d. Additional fasteners may be required to meet wind-load requirements based on results of fastener pull tests. Number of fasteners required calculated based on assumed 400 lb pull-out values for the concrete deck.
2. Roof LS2
- a. Field Wind Uplift Zone: Minimum of 8 fasteners per 4 ft x 8 ft board.
 - b. Perimeter Wind Uplift Zone: Minimum of 12 fasteners per 4 ft x 8 ft board.
 - c. Perimeter Wind Uplift Zone of Roof at Overhang: Minimum of 15 fasteners per 4 ft x 8 ft board.
 - d. Corner Wind Uplift Zone: Minimum of 17 fasteners per 4 ft x 8 ft board.
 - e. Corner Wind Uplift Zone of Roof at Overhang: Minimum of 24 fasteners per 4 ft x 8 ft board.
 - f. Additional fasteners may be required to meet wind-load requirements based on results of fastener pull tests. Number of fasteners required calculated based on assumed 200 lb pull-out values for the wood deck.
3. Roof LS3
- a. Field Wind Uplift Zone: N/A
 - b. Perimeter Wind Uplift Zone: N/A
 - c. Corner Wind Uplift Zone: Minimum of 18 fasteners per 4 ft x 8 ft board.
 - d. Additional fasteners may be required to meet wind-load requirements based on results of fastener pull tests. Number of fasteners required calculated based on assumed 200 lb pull-out values for the plywood deck.
- A. Adhere cover board using specified adhesive applied in accordance with wind uplift rating requirements and associated ribbon spacing patterns. Do not adhere boards larger than 4 ft by 8 ft or smaller than 2 ft in any direction.
- 1. Do not apply adhesive during inclement weather or to wet or damp surfaces. Do not apply adhesive if surface and/or ambient temperatures are outside of the manufacturer's recommended range.

2. Place cover board into the adhesive shortly after it has reached its maximum rise (typically within 2 min.). Walk and roll boards into place using a 150 lb roller and weigh the boards down until the adhesive sets (generally within 7 min.). Do not use buckets of adhesive to weigh boards down.
- B. Offset parallel insulation and cover board joints between and within each layer at least 6 in.
 - C. Arrange insulation board staggers at the end of each day's work to provide continuity of staggered joints between adjacent work areas.
 - D. Install tapered insulation, sumps, and crickets to provide slope-to-drain as shown on the approved Shop Drawings. Provide tapered insulation systems as required to create adequate slope-to-drain and prevent ponding on finished roof surfaces, neatly metered at corners, and trimmed as necessary for smooth surface transitions. Provide crickets behind all obstructions to flow toward drains.
 - E. Do not use pieces of insulation smaller than 18 in. in length or width. Neatly fill any open joints in the insulation more than 1/8 in. in width with matching materials.
 - F. Score cover boards at all changes in plane of the tapered insulation. Cover boards must remain attached and follow the contour of the tapered insulation below.

3.06 PVC MEMBRANE INSTALLATION

- A. Follow the membrane manufacturer's written directions to install and adhere membrane roofing system except as modified in this Section. Sarnafil G410 must be installed by a Sika-Sarnafil Authorized Applicator.
- B. Use the maximum size of all sheet materials to reduce the number of joints in the system. Position sheets to minimize number of seams and provide for 4 in. overlaps and end laps. Stagger end laps 12 in. minimum. Allow sheets to relax a minimum of 30 min. before bonding or attachment.
- C. Place membrane panel, starting at the low point of the roof; unroll and allow to relax for a minimum of 30 min. before attaching or splicing. Position sheet so that each preceding sheet is lapped a minimum of 3 in. Position laps so that water runs across or parallel. Do not make seams that buck water. Orient sheets parallel to each other.
- D. The membrane shall be adhered with the approved adhesive. Follow all manufacturer's installation instructions and recommendations for application of the adhesive and installation of the PVC membrane. Pay particular attention to weather and temperature restrictions.
- E. At the base of walls and curbs install termination bars with the specified fasteners and recommended spacing. Fasteners shall clamp the membrane tightly to the substrate.
 1. Heat-weld PVC cord to the PVC membrane on the outside of the termination bar.

3.07 PVC MEMBRANE SEAM CONSTRUCTION

- A. Minimum width of seams is 4 in. for hand welding and 3 in. for machine welding.
- B. Heat-weld seams per manufacturer's installation instructions. Use manufacturer-approved electric hot-air-welding devices to provide continuous watertight seals. All welds must be constructed by skilled mechanics trained in the welding procedure by the manufacturer.
- C. Sweep the mating surfaces of the membrane at the seams with a stiff broom to remove any debris or dirt that may have accumulated. If required, wash membrane with cleaner recommended by the manufacturer and allow it to dry.
- D. Whenever possible, all field splices on the horizontal surface (including flashing) should be completed using an automatic heat welder that has been designed for hot-air welding of thermoplastic membranes. Seams made with the automatic welder must be a minimum of 1-1/2 in. wide.
 - 1. The air intake, temperature, and speed of the machine must be adjusted to provide proper seam strength.
 - 2. An ample power supply must be provided to all heat-welding equipment. Provide a generator dedicated to the heat-welding equipment.
 - 3. When weather conditions vary, adjustments to the welding machine must be made. Conduct test welds on spare material prior to beginning the finished product sheet.
- E. Handheld welders shall only be used on vertical welds, or where an automatic welder is not practical or cannot be used. Seams made with handheld welders must be a minimum of 2 in. wide. Use silicone hand rollers to ensure proper mating of surfaces as heat-welding proceeds.
- F. Cover T-joints with a circular patch of PVC membrane centered on the joint.
- G. All heat-welded seams are to be tested for conformity by running a seam probe along the joint after the heat-weld has cooled. Any discontinuities shall be re-welded or patched. Positive evidence of welding is a characteristic uninterrupted extrusion of melted black material from the joint.
- H. On-site evaluation of welded seams shall be made daily by the Contractor in locations as directed by the Owner, the Engineer, or the Owner's Representative. 2 in. wide cross-section samples shall be taken through completed seams. Correct field welds will fail from shearing of the membrane prior to separation of the weld. Patch all areas of test cuts at no additional cost to the Owner.

3.08 PVC MEMBRANE FLASHING CONSTRUCTION

- A. PVC flashing system construction to be similar to, and with the same requirements as, the PVC roof system. Proceed with flashings as the roof membrane is completed to

ensure positive waterproof protection at all projections from the roof. Comply with the manufacturer's written instructions except as modified herein.

- B. Surfaces to be flashed must be clean, dry, and smooth.
- C. Provide termination bars at the top termination of the membrane and at the perimeter of the roof and large roof openings. Secure the termination bars to the substrate with specified fasteners at 6 in. o.c. Allow a 1/4 in. gap at bar ends for expansion.
- D. Bond flashing to substrates and field membrane using substrate adhesive following the manufacturer's written directions for application, method, and coverage rates. Fold the flashing onto the prepared substrate to eliminate wrinkles, folds, and nonbonded areas. Provide minimum 6 in. wide heat-welded seams beyond the peel stop.
- E. Extend flashing onto the tops of the roof curbs and 3 in. onto the exterior vertical surface of the curb. Tack outside edge of flashing sheet in place with specified fastener at 6 in. o.c. Extend flashing 12 in. minimum onto field sheet beyond the termination bar and fully adhere the flashing sheet to the plywood at the inside face of the wall.
- F. Fasten to top of curb and wall flashing with specified fasteners 6 in. o.c. minimum. Seal the top edge of vertical flashing with Water Cut-Off Mastic and secure the membrane as shown on the approved shop drawings.
- G. At the base of building walls, extend the flashing sheet 12 in. minimum onto the field sheet beyond the termination bar and fully adhere the flashing sheet to the plywood at the inside face of the wall, terminating the sheet immediately below the metal flashing. Fasten the top edge of sheet with the specified fastener at 6 in. o.c.
- H. Flash penetrations with the manufacturer's premolded pipe flashings where shown. Do not cut or patch premolded pipe flashings to assist in their installation. Verify that the premolded flashings will provide the specified flashing height. Seal top edge of pipe flashing with sealant and stainless steel hose clamp.

3.09 PVC-CLAD METAL FLASHING

- A. Install PVC-clad metal flashing in accordance with membrane waterproofing system manufacturer's written instructions and applicable requirements included in Section 076000 – Sheet Metal Flashing.
- B. Form sheet metal on a bending brake. Perform shaping, trimming, and hand-seaming in the shop as far as practicable with the proper sheet-metal working tools. Make the angle of the bends and the folds for interlocking the metal with full regard for expansion and contraction to avoid buckling or other deformation in service.
- C. Construct PVC-clad scuppers using one piece so as to have only one seam, located at the top of the scupper.
- D. Bed PVC-clad metal scuppers in sealant and fasten flanges of the sheet metal with fasteners into the substrate with two fasteners minimum per flange.

- E. Secure seams in PVC-clad metal flashing with rivets (specified in Section 076000 – Sheet Metal Flashing) and strip over seam with PVC membrane flashing, heat-welded on all sides.

3.10 FLASHING AT DRAINS

- A. Lay out work so that no laps come within 6 in. of the drain.
- B. Clean drain parts of all traces of existing bitumen, dust, dirt, sealants, or other construction materials or contaminants prior to installing the roofing membrane.
- C. Position the membrane and cut a hole for the roof drain allowing 1/2 in. to 3/4 in. of membrane inside the clamping ring and extending 18 in. beyond the drain in the field, and full height at the walls and curb. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
- D. Fully coat the drain-bowl clamping edge with sealant and press the edge of the flashing sheet into sealant. Ensure complete and continuous bond of the sheet to the edge of the drain. Use asphalt-compatible PVC membrane at the drains.
- E. Install Water Cut-Off Mastic on the clamping ring seat flange below the membrane. Use a minimum of one-half of a 10 oz tube for a 10 in. drain.
- F. Set and tighten the drain clamping ring.

3.11 SCUPPER INSTALLATION

- A. Cut and remove existing masonry at scupper locations as indicated on drawings. Apply a cementitious parge coat where necessary to provide smooth surfaces at scupper perimeter inside and around the scupper.
- B. Install copper and PVC-clad metal flashing in accordance with membrane waterproofing system manufacturer's written instructions, and applicable requirements included in Section 076000 – Sheet Metal Flashing.
- C. Form sheet metal on a bending brake. Perform shaping, trimming, and hand seaming in the shop as far as practicable with the proper sheet-metal working tools. Make the angle of the bends and the folds for interlocking the metal with full regard for expansion and contraction to avoid buckling or other deformation in service. Make right angle bends slightly less than 90° to ensure a spring-clip engagement of the flashing horizontal leg to the counterflashed surface; in no case shall the horizontal leg be flat or slope toward the element being flashed. All lines and arises shall be straight and crisp, except where thickness of metal dictates radius bend. Hem all exposed edges 1/2 in. minimum.
- D. Construct sheet metal scuppers using one piece and locate seams at the top.
- E. Bed PVC-clad metal at the scuppers in sealant and fasten top edges of the sheet metal with fasteners into the wood blocking on top of the curb, two fasteners per side.

- F. Secure seams in PVC-clad metal flashing with rivets (specified in Section 076000 – Sheet Metal Flashing) and strip over with PVC flashing, heat-welded on all sides.

3.12 WALKWAY PAD INSTALLATION

- A. Cut the walkway pads into lengths that can be easily handled, within the following range: minimum 3 ft, at locations where drainage is expected across the walkway pads and maximum 8 ft at other locations. Cut pads to consistent lengths for a neat finished appearance. Submit the proposed walkway pad length for approval.
- B. Install walkway pads in locations shown on the Drawings. Lay out walkway pads with the smooth surface face down. Space each pad a minimum of 1 in. and a maximum of 3 in. to allow for drainage. Provide spaces at regular intervals within the range specified above and at all valleys, including edges of crickets.
- C. Heat weld the entire perimeter of the pad continuously watertight to the membrane, following standard procedures for cleaning and heat-welding seams described above.

3.13 MEMBRANE REPAIRS

- A. Repair a puncture in the membrane with like material. The repair must extend a minimum of 2 in. beyond the boundary of the affected area in all directions. Round all corners of the repair piece. A pinhole will require a minimum 4 in. x 4 in. patch.
- B. Newly installed membrane shall be cleaned as described above for standard seaming details.
- C. When repairing a membrane that has been in place for some time or has been subjected to dirt or contamination, it is necessary to remove accumulated field dirt. Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water and then rinsing with clear water and drying with clean cotton cloths. For membrane with a significant accumulation of dirt, cleaning with acetone and a clean cotton cloth may be required.
- D. Heat weld the repair as described above for standard seaming details.

3.14 REPAIR OF CRACKED DRAIN LEADER

- A. Clean existing cracked drain line to remove all dirt, debris, and other materials that will inhibit the bond of the epoxy liner.
- B. Scope drain line prior to application of liner to identify cracks, holes, and other deficiencies; document observed deficiencies on an elevation plan.
- C. Apply and cure fluid-applied epoxy liner in accordance with the manufacturers' requirements and recommendations.
- D. Following application and curing of epoxy liner, scope the drain line again focusing on areas of observed deficiencies to confirm all cracks, holes, and other defects are

repaired; reapply epoxy liner and repeat scoping as necessary to provide a watertight drain leader.

- E. Perform a leak test of the repaired drain liner to confirm repair.

3.15 REMOVAL AND REINSTALLATION OF ROOF-MOUNTED EQUIPMENT

- A. Perform mechanical and electrical work using licensed mechanics, for necessary removal, storage, and reinstallation of rooftop equipment. Provide the Owner with minimum seven (7) days' advanced notice of shutdowns and conform to scheduling requirements of the Owner. Coordinate with Propark for removal and reinstallation of security cameras.
- B. Coordinate work to allow roofing reconstruction to proceed unimpeded, and replace mechanical equipment to reconnect electrical lines promptly after roofing work is complete.
- C. Contractor's Superintendent shall be on site when equipment is being removed, replaced, and reinstalled on the roof.
- D. Verify the operating condition of all mechanical equipment of rooftop units. Submit a written report to the Owner of the existing conditions. Restore operating condition of the equipment at the end of the Project.
- E. Disconnect and tag all power wiring and control wiring on all rooftop units that are to be disconnected and reconnected. Leave all disconnected lines in a safe condition during the work.
- F. Extend ducts and services to match existing, wherever needed to provide proper operation of all units that have been raised or relocated. Raise conduit and reroute wiring as required to reconnect fixtures.
- G. Reinstall and reconnect all electrical power and control wiring.
- H. Reinstall all mechanical work. Start up and verify the operating condition of all mechanical equipment that was disconnected and submit a written report to the Owner. Correct any deficiency that was not reported before removal, at no additional cost to the Owner.

3.16 CLEANUP

- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 076000

SHEET METAL FLASHING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 BASE BID

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide the following sheet metal repairs or replacement as described below at each roof location:

1. Roof CT1: Steep-Slope Roofs at North and South Wings

- a. Provide copper flashing associated with the repairs of the clay tile roofing, including, but not limited to:
 - (1) Cladding at dormer side walls.
 - (2) Step flashing at rising walls (at dormers, gables, and confined rakes).
 - (3) Counterflashing at the base of masonry rising walls; reuse existing reglets, except where reglets are indicated to be new.
 - (4) Ridge flashing.
 - (5) Pipe penetration flashing.

- (6) Dormer roof flashing.
 - (7) Eave flashing integrated with the existing copper gutters (to remain).
 - b. Provide a copper wash at the up-slope sides of the masonry turrets (two total).
- 2. Roof LS1: Low-Slope Roof at Center Wing
 - a. Provide copper flashing associated with the new PVC roofing, including, but not limited to:
 - (1) Coping caps.
 - (2) At roof curbs and sleepers.
 - (3) At the exiting roof hatch (to be removed and reinstalled).
 - (4) At the base of the existing skylight.
 - (5) Counterflashing at the base of rising masonry rising walls and the chimney; reuse the existing reglets, except where reglets are indicated to be new.
- 3. Roof LS2: Low-Slope Roof at South Addition
 - a. Provide copper flashings associated with the new PVC roofing system, including, but not limited to:
 - (1) At roof penetrations.
 - (2) At the edge of the roof.
 - (3) Counterflashing at the rising masonry wall; reuse the existing reglet.
 - b. Provide a copper hung gutter, where indicated on the Drawings.
 - c. Provide zinc-tin-coated copper down leaders connected to the copper gutter.
- D. On a Unit Price Basis, undertake the following types of localized sheet metal repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - 1. Roof CT1: Steep-Slope Roofs at North and South Wings
 - a. Repair cracked solder joints in the existing copper gutters to remain by removing the existing solder and re-soldering.

- b. Repair holes in the existing copper gutters to remain by soldering a copper patch over the existing hole or tear.

1.04 ADD ALTERNATE

A. Provide add alternate costs for the following:

1. Add Alternate #AS1: Bus Canopy Roof

- a. Provide copper flashing associated with the new asphalt single roofing, including, but not limited to:
 - (1) Fascia.
 - (2) Eave flashing.
 - (3) Rake flashing.
- b. Provide built-in copper gutters including expansion joints, connect gutters to existing down leaders.

2. Add Alternate #AS3: Inactive Platform Canopy Roof

- a. Provide copper flashing associated with the new asphalt single roofing, including, but not limited to:
 - (1) Fascia.
 - (2) Eave flashing.
 - (3) Rake flashing.
 - (4) Transition to clay tile roofing.
 - (5) Counterflashing at the base of the masonry rising wall, reuse the existing reglet.
- b. Provide built-in copper gutters including expansion joints, connect gutters to existing down leaders.
- c. On a Unit Price Basis, undertake the following types of localized sheet metal repairs at each roofing location, where directed by the Engineer in the field. Quantities for unit price work as shown on the Drawings.
 - (1) Extend existing down leaders as needed so that they discharge at grade or onto a lower roof (assume up to 16 ft. extension length per location).

3. Add Alternate #LS2: Omit work described above in Paras. 1.03-C-3-a. Refer to Section 076100 – Copper Roofing (Add Alternate #LS2) for copper flashing associated with the new copper roofing.

4. Add Alternate #LS3: Low-Slope Roof at East Entrance Canopy
 - a. Provide copper flashings associated with the new PVC roofing system, including, but not limited to:
 - (1) At the roof edge.
 - (2) Counterflashing at the base of the masonry rising wall, reuse the existing reglet.
- 1.05 COORDINATE WITH RELATED WORK
- A. Coordinate the work of this Section with the work of other trades under this Contract, including but not limited to:
 1. Section 013000 – Submittals.
 2. Section 014000 – Quality Control and Project Procedures.
 3. Section 015000 – Construction Facilities and Site Use.
 4. Section 016000 – Temporary Protection.
 5. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
 6. Section 073213 – Clay Tile Roofing.
 7. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
 8. Section 076100 – Copper Roofing (Add Alternate #LS2).
 9. Section 079200 – Joint Sealant.
- 1.06 REFERENCE STANDARDS
- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
 1. Connecticut State Building Code, current edition.
 2. “Copper and Common Sense” by Revere Copper Products, Rome, New York. Referenced for general sheet metal workmanship and detailing.
 3. Secretary of the Interior’s Standards for the Treatment of Historic Properties.
 4. Product manufacturer’s written recommendations.
 5. ASTM International (ASTM): Standards as specified or referenced herein.

6. FM 1-49 Loss Prevention Data Sheet for Perimeter Flashing.
7. FM 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.
8. ANSI/SPRI ES-1.

1.07 SUBMITTALS

A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.

1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
2. Shop Drawings: Submit shop drawings of all metal flashings showing exact profile, joints, terminations, transitions, and methods of attachment, including location of sheet metal expansion joints.
3. Samples: Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.08 MOCKUPS

A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.

1. Provide the following mockups at the steep-sloped roofs as indicated in the table below:

Roof	Eave Flashing	Rake Flashing	Ridge Flashing	Base-of-Wall Flashing	Base-of-Wall Counterflashing	Fascia	Gutters (including expansion joint)
AS1 (Add Alt. AS1)	10 LF	5 LF	-	-	-	10 LF	10 LF Gutter, 1 EA Gutter Expansion Joint
AS3 (Add Alt. AS3)	10 LF	5 LF	10 LF at Transition to CT1	10 LF	10 LF	10 LF	10 LF Gutter, 1 EA Down leader extension
CT1	10 LF at Eave of Main Roof 5 LF at Eave of Dormer Roof	-	10 LF at Ridge of Roof 1 EA at Dormer Window Sill	5 EA Step Flashing 5 LF Continuous Flashing at Gables	1 EA Dormer Cladding 5 LF at Step Flashing 5 LF at Continuous Flashing at Gables	-	1 EA of Repaired Solder Joint 1 EA of Hole Repair

2. Provide the following mockups at the low-sloped roofs as indicated in the table below:

Roof	Edge Flashing	Coping Caps	Curb / Sleeper Flashing	Base-of-Wall Flashing	Base-of-Wall Counterflashing	Base of Skylight	Gutters and Down Leader
LS1	-	10 LF including expansion joint	1 EA Curb Flashing 1 EA Sleeper Flashing	10 LF	10 LF	5 LF	-
LS2	10 LF	-	-	10 LF	10 LF	-	10 LF Gutter 1 EA Gutter Expansion Joint 1 EA Down Leader
LS3 (Add Alt. LS3)	10 LF	-	-	5 LF	5 LF	-	-

1.09 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

1.10 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.

- B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least five years of successful experience on similar work on historic buildings.
- C. Soldering Workmanship Test: All persons who will perform soldering on the project will be required to pass a soldering workmanship test. In the presence of the Engineer, all workers proposed to undertake soldering on the project shall execute soldering samples of a double-locked flat seam for cutting open and inspection by the Engineer. The cut-open solder joint must be fully sweated with solder for the joint to pass this prerequisite Soldering Workmanship Test.

1.11 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Metal Flashing: Cold-rolled "red" copper conforming to ASTM B370 (H00). All sheets shall carry markings of producer, temper, and weight. Use 20 oz copper.
 - 1. Solder: ASTM B32, Class 50A or 50B, bar form, 50% block tin, and 50% pig lead.
 - 2. Flux: Conforming to ASTM B813.

3. Coating (where indicated): Coating to consist of alloy that is approximately 20% tin and 50% zinc and be applied by the hot-dip process with an approximate 0.5 mil thickness to both sides. Freedom Grey by Revere Copper Products Inc. or Similar.
- B. Sealant and Preshimmed Tape: As specified in Section 079000 – Joint Sealant.
- C. Fasteners:
1. For Attaching to Masonry or Concrete: Drive-in-type expansion anchor with nylon sleeve and a 1/4 in. dia. stainless steel pin with a mushroom head, length to provide a minimum of 1-1/4 in. embedment. Acceptable manufacturers include Rawl-Powers Inc., Hiliti, or Elco Construction Products.
 2. For Attaching to Wood or Plywood: 12 ga. copper nails, with minimum 1/4 in. dia. flat head, annular threaded, with needle point, and of sufficient length to obtain 1-1/4 in. embedment into wood blocking, or full depth into plywood.
- D. Rivets for Copper Flashing Connections: Solid copper, 3/16 in. dia., flat-head rivets of proper length for the material being fastened. Only use rivets where explicitly specified in the construction documents or where directed by the Engineer. “Pop” or blind rivets are prohibited.
- E. Gutters: Constructed of 24 oz red copper, size and shape as generally shown on Drawings. End Caps and expansion joints to be riveted and soldered fully watertight.
1. Gutter Straps (at LS2): Red copper, brass, or bronze, 1 in. wide by 1/8 in. thick, length as required.
 2. Gutter Braces (at LS2): 24 oz red copper, 3 in. wide, bent to form a channel 1-1/2 in. wide and 3/4 in. flanges. Space braces at same spacing as straps. Soldered and riveted to gutter lining.
- F. Down leaders (at LS2): 20 oz coated red copper, size 4 in. by 4 in.
1. Straps: 1 in. wide 20 oz zinc-tin-coated copper, spaced no more than 10 ft apart, minimum of two straps per down leader.
- G. Down leader Extensions (at AS3): Schedule 40 PVC pipe, black. Pipe shall be solid with a smooth interior and diameter to match the existing.
1. Accessories: Provide down leader inlet at roof deck (at new down leaders only) and all fittings and necessary jointing materials, adapters, and other appurtenances required to provide a watertight down leader that directs water to grade or a lower roof.
 2. Attachment Accessories: Stainless steel straps, painted black, to secure the down leader to the posts, similar to the existing.

H. Materials for Metal Flashing Expansion Joints:

1. Release Tape: As specified in Section 079200 – Joint Sealants.
 2. Membrane Flashing at Splices: 0.060 in. thick uncured self-adhered EPDM strip flashing, such as “Quickseam Formflash” by Firestone Building Products Co., or equal. Acceptable manufacturers include Firestone Building Products, Carlisle SynTec, and Johns Manville.
 3. Cleaner, Primer, and Adhesive: As recommended by the membrane-flashing manufacturer.
 4. Lap Sealant: One-component, high-performance, nonpriming, gun-grade, elastomeric polyurethane sealant, such as MasterSeal NP-1 by BASF or approved equal.
- I. Low Profile Expansion Joint: Premanufactured expansion joint consisting of two strips of 0.6 mm gauge copper connected by a neoprene expansion joint, thickness 4 mm and width 98 mm. T-Pren Gutter Expansion Joint by Matthew Hebden or approved equal.
- J. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.

3.02 GENERAL SHEET METAL WORKMANSHIP

- A. Except as modified in this Section, comply with all recommendations of the current edition of Revere’s “Copper and Common Sense” for general workmanship requirements and details of forming joints. Completed metal shall be straight, flat, and without buckles, dents, scratches, or other blemishes.
- B. Do not apply any new materials until the exposed surface of the substrate is clean, smooth, and dry. Do not work in rain, snow, winds gusting over 30 mph, temperatures below 40°F, or any presence of water. Comply with applicable recommendations by manufacturers of all materials for workmanship and handling, except as modified in this Section.

- C. Form sheet metal on a bending brake. Perform shaping, trimming, and hand-seaming in the shop as far as practicable, with the proper sheet metal working tools. Make the angle of the bends and the folds for interlocking the metal with full regard for expansion and contraction to avoid buckling or other deformation in service. All lines shall be straight and crisp except where thickness of metal dictates radius bend, and all exposed edges shall be hemmed 1/2 in. minimum, unless noted otherwise on drawings.
- D. Reinforce all metal flashing corners as required; rivet and solder all flashing corners for permanently waterproof connections. Space rivets at 1 in. o.c. in staggered pattern unless otherwise indicated. After soldering, immediately remove all traces of acid or flux with an appropriate neutralizer, followed by repeated washing and scrubbing.
- E. Lay out metal flashing to minimize transverse joints. Detail transverse joints in all flashing pieces to provide a watertight connection, and allow for expansion/ contraction of the metal as shown on the Drawings. Provide prefabricated corner pieces with joints locked, riveted, and soldered watertight. Space rivets at 1 in. o.c. in staggered pattern unless otherwise indicated.
- F. For any soldering work done on site, protect building components below the flashing from drips of solder or flux by temporarily installing tarps, felt paper, or other protective sheet materials.
- G. Soldering:
 - 1. Immediately prior to soldering, mechanically clean all metal to be soldered with steel wool or by other acceptable means, apply flux, and pre-tin. Clean metal again if it is not soldered on the same work day.
 - 2. Lap metal and fully sweat all flashing corners, end dams, and joints with solder for permanently waterproof connections. Maintain continuity of flashings and watertightness at all jogs, steps, transitions, corners, and similar areas.
 - 3. Reinforce all metal flashing corners as required; rivet and solder all flashing corners for permanently waterproof connections. Space rivets at 1 in. o.c. in a staggered pattern unless otherwise noted.
 - 4. Perform all soldering slowly with well-heated irons with properly tinned, clean, blunt tips. Do not use torches. Apply enough heat to sweat the solder completely through the full width of the seam. Close clinch lock seams gently with a block of wood and mallet, then flux and show at least one full inch of continuous and evenly flowed solder. Whenever possible, do all soldering in flat position. All sloped and vertical seams shall be laced and soldered a second time.
 - 5. After soldering, immediately remove all traces of acid of flux with an appropriate neutralizer, followed by repeated washing and scrubbing.
- H. Integrate all metal flashings with surrounding materials as shown on the approved Shop Drawings.

3.03 METAL FLASHING INSTALLATION

- A. Provide metal flashing systems as shown on the approved shop drawings. Coordinate metal flashing details with existing roof flashing to remain.
- B. Nail all roof metal flashings with two rows of approved fasteners at 4 in. o.c. in each row, staggered. Nail all through-wall metal flashings with two rows of approved fasteners at 16 in. o.c. in each row, staggered. Bend all drip edges 1/4 in.
- C. Step flashings: Provide individual step flashings at all rising walls between all clay roof tile shingles adjacent to the wall. Extend the bottom edge of counterflashings to within 1/2 in. of the bottom of the overlying clay roof tile shingle. Extend step flashing up the wall to the height of the counterflashing and onto the roof deck at least 8 in. Provide 2 in. minimum head lap at clay roof tile shingles between steps.
- D. Provide metal receiver strips at vertical terminations and where indicated on the Drawings. Provide a pre-shimmed butyl tape between the receiver strip and the substrate. Fill the receiver metal solid with sealant.
- E. Reglets: Reuse existing reglets, except where new reglets are indicated on the Drawings. Saw cut masonry at locations of new and existing reglets, as needed, to achieve reglet dimensions as shown on the Drawings. Fasten the upturned leg of flashing in the reglet at 6 in. o.c. Provide sealant into reglet joint, refer to Section 079200 – Joint Sealant.
- F. Provide flashing at roof eaves, fascia, rakes, and changes in slope as detailed, nailed to the substrate as shown on the Drawings. Overlap joints between flashing pieces 6 in. and fill lap with sealant.
- G. Provide continuous hook strips where indicated on the Drawings, nailed 6 in. o.c. Crimp the formed hook of metal flashing onto the hook strip, forming a 3/4 in. loose lock, overlapping the hook strip at least 1/2 in.
- H. Cleats: Provide 2 in. wide metal cleats at 12 in. o.c., two fasteners per cleat, where shown on the Drawings. Crimp the formed hook of the metal flashing into the cleat, overlapping the cleat at least 1/2 in.
- I. Receiver strips: Provide metal receiver strips where detailed. Break metal as detailed. Provide a solid bed of sealant in joints and behind receiver metal.
- J. Fabricate copper flashing to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form expansion joints of intermeshing hooked flanges, not less than 1 in. (25 mm) deep, filled with butyl sealant concealed within joints.

3.04 SHEET METAL FLASHING EXPANSION JOINTS

- A. Provide watertight flashing expansion joints where necessary due to length of flashing but no more than 20 ft apart or 2 ft from a corner or change in direction of the flashing.

- B. At expansion joints in metal flashing, lap all transverse joints 1 in. and apply release tape, adhered EPDM strip flashing, and metal cover plate. Apply 2 in. wide release tape centered over the exposed lap (e.g., 1 in. to either side). Adhere EPDM strip flashing over joint as follows:
1. Cut and position EPDM sheets in place and allow sheets to relax 1/2 hr after unrolling before applying adhesive. Inspect sheet for any discontinuities or deficiencies; do not use defective sheets. Do not use sheets with more than six pinholes in one of the two plies per square foot of sheet.
 2. Apply release tape over all joints and edges of the flashing covered by adhered EPDM sheet and where shown on the Drawings.
 3. Clean all metal surfaces scheduled to receive EPDM with clean, lint-free rags. Wet one rag with solvent and wipe surface. Use second rag to clean surface before solvent evaporates. Pump solvent from cans onto first rag. Do not dip rag into solvent to avoid contamination of solvent. Allow to dry.
 4. Prime all substrates to which EPDM is to be adhered with appropriate primer, and allow primer to dry a minimum of 2 hrs. Recoat primed areas not covered by adhered EPDM within 12 hrs.
 5. Brush-apply a full continuous coat of adhesive without holidays (missed spots) to the substrate and the sheet using circular motion; roller application is not allowed. Allow adhesives to dry until tacky. Do not exceed maximum open time recommended by the manufacturer, or 12 hrs. Do not use and remove from the site, all EPDM that has been coated with adhesive and allowed to exceed the maximum open time or exposed for more than 12 hrs, or that has been exposed to any moisture before being applied to the substrate. Do not expose adhesive-coated substrate to any moisture, or to air for more than 12 hrs. Protect adhesive from airborne dust and debris while drying.
 6. Once the adhesive is dry, lay sheets into it promptly. Do not move or reposition sheets once they have contacted the adhesive. Immediately roll entire sheet into firm contact with the substrate using a smooth metal roller. Form sheets tightly into bends in flashing without stretching or cutting rubber sheet.
 7. After 1 hr, caulk continuously all edges of EPDM flashing with lap sealant and tool out over edges.
 8. After lap sealant has cured, install metal cover plate over EPDM flashing strip. Hook hem of metal cover plate around existing underlying flashing to secure the cover plate.

3.05 INSTALL GUTTERS AND DOWN LEADERS

- A. Install gutters, down leaders, and attendant accessories in accordance with the Contract Drawings and the manufacturer's printed recommendations for details and application techniques, except as modified in this Section.

- B. Install gutters and down leaders in locations shown in the Drawings.
 - C. Run gutters with a minimum slope of 1/8 in./ft. Make adequate provisions for thermal movement of all gutters and down leaders.
 - D. Install gutter braces, straps, and hangers as shown on the approved Shop Drawings. Ensure that a minimum of one brace lies within 8 in. of the end of the gutter and at gutter-to-down-leader connections.
 - E. Install gutter with adequate provisions for thermal movement of all gutters.
 - F. Provide gutter expansion joints in the copper gutter between down leaders and at no more than 24 ft from an inside or outside corner or change in direction of the gutter.
 - 1. Install low-profile expansion joints where water will need to flow past the expansion joint to reach a down leader.
 - 2. Install bulkhead type expansion joints between two down leaders.
 - G. Approximate locations of low-profile and bulkhead type expansion joints as shown on the Drawings.
 - H. At extensions to existing PVC down leaders, construct down leader extensions to extend around obstructions (e.g. structural framing members) and extend to grade or a lower roof connected to the nearest canopy post.
- 3.06 CLEANUP
- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 076100

COPPER ROOFING (ADD ALTERNATE #LS2)

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 ADD ALTERNATE #LS2

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.
- C. On a Lump-Sum Basis, provide and Add Alternate price for the following roofing replacement at Roof LS2 as described below:
 - 1. Provide new copper roofing system consisting of, from bottom to top: Plywood sheathing (refer to Section 061000 – Rough Carpentry), high-temperature self-adhered membrane underlayment, slip sheet, copper panel roofing.
 - a. At steep-slope areas of the roof, provide standing-seam copper roof panels.
 - b. At low-slope areas of the roof, provide flat-seam copper roof panels, with fully-soldered joints, except at expansion joints designed to accommodate thermal movement.
 - 2. Provide copper flashings associated with the copper roofing as shown on the Drawings, including but not limited to:

- a. Eave flashing.
- b. Ridge flashing.
- c. Transition flashing at change in slope of the roof.
- d. Base-of-wall flashing and counter flashing.

1.04 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to:
 1. Section 013000 – Submittals.
 2. Section 014000 – Quality Control and Project Procedures.
 3. Section 015000 – Construction Facilities and Site Use.
 4. Section 016000 – Temporary Protection.
 5. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
 6. Section 076000 – Sheet Metal Flashing.
 7. Section 079200 – Joint Sealant.

1.05 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
 1. Connecticut State Building Code, current edition.
 2. “Copper and Common Sense” by Revere Copper Products, Rome, New York. Referenced for general sheet metal workmanship and detailing.
 3. Secretary of the Interior’s Standards for the Treatment of Historic Properties.
 4. Product manufacturer’s written recommendations.
 5. ASTM International (ASTM): Standards as specified or referenced herein.
 6. FM 1-49 Loss Prevention Data Sheet for Perimeter Flashing.
 7. FM 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.
 8. ANSI/SPRI ES-1.

1.06 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 2. Shop Drawings: Submit shop drawings of copper roofing including flashings showing exact profile, joints, terminations, transitions, and methods of attachment, including location of sheet metal expansion joints.
 3. Samples: Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

1.07 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.
1. Standing Seam Copper Roofing: 100 SF.
 2. Flat-Seam Copper Roofing: 100 SF.
 3. Edge Flashing: 10 LF.
 4. Flashing at Transition in Roof Slope: 10 LF.
 5. Base-of-Wall Flashing and Counterflashing: 10 LF.
 6. Ridge Flashing: 10 LF.

1.08 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

- B. Do not store sheet metal roofing materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal roofing materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal roofing materials from contact with water.

1.09 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.
- B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least five years' successful experience on similar work on historic buildings.
- C. Soldering Workmanship Test: All persons who will perform soldering on the project will be required to pass a soldering workmanship test. In the presence of the Engineer, all workers proposed to undertake soldering on the project shall execute soldering samples of a double-locked flat seam for cutting open and inspection by the Engineer. The cut-open solder joint must be fully sweated with solder for the joint to pass this prerequisite Soldering Workmanship Test.

1.10 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Metal Roofing Panels and Flashing: Cold-rolled “red” copper conforming to ASTM B370 (H00). All sheets shall carry markings of producer, temper, and weight. Use 20 oz copper.
1. Solder: ASTM B32, Class 50A or 50B, bar form, 50% block tin, and 50% pig lead.
 2. Flux: Conforming to ASTM B813.
- B. High-Temperature, Self-Adhered Membrane Underlayment: Butyl-based, non-asphaltic self-adhering membrane, with integrally bonded polyethylene laminate, formulated for use below metal roofing or in high-temperature environments, as recommended by the manufacturer; “Grace Ultra,” as manufactured by W.R. Grace.
1. Liquid Membrane: Bituthene Liquid Membrane.
 2. Primer: As recommended by the manufacturer.
- C. Slip Sheet (install below sheet metal caps at chimneys): Rosin-sized Kraft Paper, 3.4 lb/100 sq ft minimum.
- D. Fasteners:
1. For Attaching to Masonry or Concrete: Drive-in-type expansion anchor with nylon sleeve and a 1/4 in. dia. stainless steel pin with a mushroom head, length to provide a minimum of 1-1/4 in. embedment. Acceptable manufacturers include Rawl-Powers Inc., Hiliti, or Elco Construction Products.
 2. For Attaching to Wood or Plywood: 12 ga copper nails, with minimum 1/4 in. dia. flat head, annular threaded, with needle point, and of sufficient length to obtain 1-1/4 in. embedment into wood blocking, or full depth into plywood.
- E. Rivets for Copper Flashing Connections: Solid copper, 3/16 in. dia., flat-head rivets of proper length for the material being fastened. Only use rivets where explicitly specified in the construction documents or where directed by the Engineer. “Pop” or blind rivets are prohibited.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer

immediately of any inconsistency between the conditions found and those shown in the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.

- B. Examine all surfaces scheduled to receive membrane underlayment for roughness, contaminants, unsound structural substrates, or other conditions that may impair the roofing application. Notify the Engineer in writing of any such conditions; do not commence work until all defects are remedied.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, site work, landscaping, and the building interior from all risks associated with the work. Protect persons, property, and site as required. Repair all damaged elements of the building caused by the work of this Section at no additional cost to the Owner.

3.03 GENERAL SHEET METAL WORKMANSHIP

- A. Refer to Section 076000 – Sheet Metal Flashing.
- B. Refer to “Copper and Common Sense” by Revere Copper Products for general sheet metal workmanship and detailing.
- C. Lay out panel arrangement including location of seams and cleats prior to commencing installation of the copper roofing.

3.04 INSTALLATION OF UNDERLAYMENT

- A. Clean surfaces to receive self-adhered membrane underlayment 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.
- C. The surfaces over which the self-adhered membrane underlayment is to be installed are to be smooth and free of defects such as loose pieces, holes, uneven surface, and protruding fasteners. Report any condition to the Engineer that would interfere with proper installation of underlayment.
- D. Fill all gaps in the plywood sheathing with Liquid Membrane to provide a continuous, smooth substrate.
- E. Do not apply the self-adhered membrane underlayment, unless the exposed surface of the substrate is clean and dry.
- F. Remove all dirt and debris from plywood sheathing. Prime all surfaces to receive self-adhered membrane underlayment to achieve maximum adhesion. Apply primer only to the area to be covered with membrane during the current working day. Apply

- primer with a roller or brush at the rate of 1 gal / 250 sq ft; do not spray. Allow primer to dry tack-free before covering.
- G. Install a continuous fillet bead of liquid membrane at all changes in slope of the roof to fill in gaps in the plywood substrate and to provide a smooth, continuous substrate to receive self-adhered membrane underlayment.
 - H. Apply self-adhered membrane underlayment in compliance with the printed instructions of the manufacturer, unless they are modified to be more stringent by this Section.
 - I. Begin application of sheets at bottom of slope and work up the roof slope; shingle all side laps 3-1/2 in. minimum to shed water, and provide 6 in. minimum end laps.
 - J. Apply sheets in the longest lengths practical; shingle side laps so that they do not buck water. Roll out sheets on primed surfaces and align them. Re-roll half of the sheet in its long direction and cut through the release paper, taking care not to cut the membrane.
 - K. Roll the membrane onto primed surfaces, pulling the release paper in front of the roll so that once the release paper is removed, the membrane is immediately set onto the surface. Place sheets without fishmouths or wrinkles. Do not stretch the membrane.
 - L. If fishmouths and wrinkles appear, cut out and flatten the affected area and cover it with membrane extending at least 6 in. beyond the cut on all sides.
 - M. Immediately after applying the membrane sheet, hand-press it into contact with the surface and roll the entire membrane towards lap seams with a handheld neoprene roller. Remove air pockets and patch in accordance with the manufacturer's recommendations. Create a uniform and complete bond.
 - N. Re-prime areas that become dirty or debris-covered during the course of the work prior to installing membrane.
 - O. Seal all exposed perimeter edges at temporary tie-ins with specified mastic each day and remove mastic before applying additional membrane.
 - P. Install slip sheet, wrinkle free, over underlayment before installing copper roofing.

3.05 INSTALLATION OF FLAT-SEAM COPPER ROOFING

- A. Form 24 in. by 18 in. maximum pans from sheet copper typical. Fold 3/4 in. of the top edge and one side 180° over the pan, and 3/4 in. of the bottom edge and other side 180° under the pan. Notch the corners of the pans, so that the folded edges do not interfere at the corners.
- B. Apply panels with the long dimension perpendicular to the roof slope. Secure the panels to the deck with 2 in. wide copper cleats, locked onto the top and side folds, and fasten to the roof deck with two nails each, staggered. Fold backs of cleats over

- the nail heads. Provide cleats in the pattern shown on the shop drawings for each panel but at least two cleats per side of panel.
- C. Lock the edges of the upper panel that are folded under onto the edges of the lower panel that are folded over, to form a flat locked seam. Stagger the vertical seams (parallel to slope) 12 in. where possible.
 - D. Solder all flat-locked seams between panels. Pre-tin all locks in panels, as required, prior to bending and assembling panels.
 - E. At rising walls, form a 3/4 in. fold on the edge of the panel. Provide cleats along the fold at 12 in. o.c., fastened to the substrate. Lock the horizontal flange of the base flashing onto the lock on the panel, and dress down using a mallet and block of wood. Solder the locked seam.
 - F. Fabricate copper roofing to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form expansion joints of intermeshing hooked flanges, not less than 1 in. (25 mm) deep, filled with butyl sealant concealed within joints.

3.06 INSTALLATION OF STANDING-SEAM COPPER ROOFING

- A. Form panels to provide minimum 1 in. high standing seams at 16 in. o.c., with sheets the full height of the roof slope.
- B. Cleat the upstanding leg of the panels using concealed cleats spaced no more than 12 in. o.c. along the length of the seam. For panels less than 16 in. long, provide two cleats along the seam; position cleats as near the edge of the panel as possible, without interfering with closure piece and without fastening through flashings. Anchor the cleats into the substrate with two fasteners per cleat.
- C. Anchor top of each standing-seam panel with two 2 in. wide cleats.
- D. Install panels in continuous lengths extending from the bottom of the steep-slope roof area to the top.
- E. Before panels are interlocked, apply a continuous bead of sealant to the top of the flange of the lower panel. Lock standing seams by folding over twice so cleat and panel edges are completely engaged.
- F. Loose lock panels to cleats and the flashing at the transition on the roof slope.
- G. Trim and fold-over standing seams at ridge and hip conditions.

3.07 CLEANUP

- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION

SECTION 079200

JOINT SEALANT

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.
- B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.
- C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

- A. Provide all labor, materials, equipment services, and accessories necessary to furnish and install work on this Section, complete and functional as indicated in the Contract Documents and as specified herein.

1.03 BASE BID

- A. Provide the Project Mobilization and General Requirements as described above.
- B. Provide the shop drawings, field testing, submittals, and mockups as described in this Section.
- C. On a Lump-Sum Basis, provide sealant joints and backer materials at the locations shown on the Drawings and approved shop drawings, including:
 - 1. Sealant joints at reglet-set metal flashing with sand broadcast onto the surface of the sealant.
 - 2. Sealant and pre-shimmed butyl tape at sheet metal receiver strips.
 - 3. Sealant associated with metal flashing and roofing systems.

1.04 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to:
 - 1. Section 013000 – Submittals.
 - 2. Section 014000 – Quality Control and Project Procedures.

3. Section 015000 – Construction Facilities and Site Use.
4. Section 016000 – Temporary Protection.
5. Section 073113 – Asphalt Shingles (Add Alternates #AS1 and #AS3).
6. Section 073213 – Clay Tile Roofing.
7. Section 075419 – Polyvinyl Chloride (PVC) Roofing.
8. Section 076100 – Copper Roofing (Add Alternate #LS2).
9. Section 076000 – Sheet Metal Flashing.

1.05 REFERENCE STANDARDS

- A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein.
1. Connecticut State Building Code, current edition.
 2. Secretary of the Interior's Standards for the Treatment of Historic Properties.
 3. Product manufacturer's written recommendations.
 4. ASTM International (ASTM): Standards as specified or referenced herein.

1.06 SUBMITTALS

- A. Submit the following items for the Engineer in time to prevent delay of the project and to allow adequate time for Engineer's review and resubmittals, if needed. Do not order materials or start work before receiving the Engineer's written approval.
1. Product Data:
 - a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.
 - b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.
 - c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.
 2. Samples: Provide samples of the materials specified herein or proposed for use in this project at the request of the Engineer.

3. Test Reports: Results from field sealant adhesion testing (Para. 3.02).

1.07 MOCKUPS

- A. The following mockups shall be prepared by the personnel who will be installing them on the project at a location on the building selected by the Engineer. Notify the Engineer at least 48 hrs before starting work on each mockup. Do not proceed with any part of the work before the Engineer approves the appropriate mockups. Approved mockups may remain in place as part of the finished work.
 1. Sealant at Reglet-Set Step Flashing: 3 EA Step.
 2. Sealant at Reglet-Set Continuous Flashing: 5 LF.
 3. Sealant at Receiver Strip, 1 EA.
 4. Coordinate with mockups required by other sections to provide sealant and backing material as needed to provide complete mockups.

1.08 PROTECTION, HANDLING, AND STORAGE

- A. Refer to Para. 1.09 in Section 014000 – Quality Control and Project Procedures.

1.09 QUALITY CONTROL AND ASSURANCE

- A. Refer to Para. 1.07 in Section 014000 – Quality Control and Project Procedures.

1.10 WARRANTY

- A. Guarantee all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the GHTD to do so. State that the obligation of these Guarantees shall run directly to the GHTD and may be enforced by the GHTD against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this Contract.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer's products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so that the work is not delayed. All materials are to be new, unless designated otherwise.

2.02 MATERIALS

- A. Sealant: Non-staining, one-part, polyurethane sealant meeting the requirements of ASTM C290, Type S, Grade NS, Class 35 that demonstrates good adhesion to metal and brownstone substrates as determined by field adhesion testing. Must be demonstrated via mockups not to stain or darken the particular brownstone on the building. Sealant to provide a minimum of $\pm 35\%$ joint movement capacity. Color to match existing sandstone masonry, to be chosen by the Engineer from the manufacturer's standard colors.
1. Approved products:
 - a. Sikaflex 15LM polyurethane sealant by Sarnafil.
 - b. NP1 polyurethane sealant by BASF.
 - c. Dymonic 100 polyurethane sealant by Tremco.
 - d. Or approved equal.
 2. Surface cleaner and primer as recommended by the manufacturer and as required by the field adhesion test, surface cleaner and primer must be proven through mockups not stain or darken the particular brownstone on the building.
 3. Sand (for broadcasting onto the surface of the sealant joint): Natural red sand to match the existing mortar joints.
- B. Sealant for use with PVC roofing system: As specified in Section 075419 – PVC Roofing.
- C. Backer Rod: Closed-cell, non-gassing, polyethylene rod. The diameter of the rod is to be approximately 25% in excess of joint width. Surface skin of rod shall be continuous and unbroken and of sufficient thickness to preclude outgassing and formation of voids in the overlying sealant.
- D. Release/Bond Breaker Tape: 0.006 in. thick polyethylene, to which sealant does not bond, adhesive backed on one side, width as required.
- E. Pre-shimmed Butyl Tape: 100% solid, highly adhesive and elastic, cross-linked butyl preformed tape with a continuous integral EPDM shim.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in

the Contract Drawings. The Engineer will determine what modifications or additional repairs are necessary.

3.02 FIELD SEALANT ADHESION TESTING

- A. At a minimum of four weeks before general sealant installation is scheduled to proceed, prepare 1 in. wide by 1/8 in. thick sealant specimens that are 4 in. long each. Use surface preparation techniques and primers recommended by the manufacturer from laboratory tests and approved by the Engineer. Prepare a total of three samples for each jobsite condition and for each surface preparation technique recommended by the sealant manufacturer. Apply 1 in. wide bond break tape across one end of each test specimen to produce an edge for gripping the specimen during testing.
- B. Cure sealant for at least twenty-one days prior to conducting field adhesion tests.
- C. Notify the technical representative of the sealant manufacturer and Engineer in writing at least one week prior to the start of sealant application and again prior to the start of the adhesion test so that they can be present to observe the installation and testing.
- D. Pull sealant joint apart and check on sealant's adhesion to the substrate. If the sealant does not adhere well to the substrates, then modify installation procedures, as recommended by the sealant manufacturer and approved by the Engineer. Do not start sealant installation until the samples are tested and approved by the Engineer.
- E. Provide a written report on test results to the Engineer, Sealant Manufacturer, and Installer. Include a description of the test setup, surface preparation methods, cure time, and test results.
- F. Perform adhesion testing as many times as necessary, at no additional cost to the University, to achieve successful results, as determined by the Engineer. Modify installation procedures following failed tests as recommended by the manufacturer and approved by the Engineer.

3.03 SEALANT JOINT PREPARATION

- A. Do not install sealant until the substrate has first been cleaned. Remove all dirt or other foreign substances, including existing sealant remnants and membrane waterproofing, from surfaces to receive sealant. All surfaces shall be dry before preparation begins. The surface preparation is to be done immediately before insertion of the final backer rod or bond breaker and after any temporary rods or seals are removed.
- B. Prepare metal surfaces as required or recommended by sealant manufacturer and field adhesion test results.
- C. Unless noted otherwise, install clean, dry backer rod; round rod; bond breaker tape; or compressible filler in or over all joint openings against dry substrates. Remove all wet materials from the jobsite. Replace any backer rod not sealed over by the end of each day and prepare surfaces again.

- D. Change rod sizes as frequently as required by the variation in the joint width. Do not twist rods together. Butt ends of rods tightly. Provide a full range of rod sizes at the site of all sealant work.
- E. Do not touch with fingers or otherwise contaminate the substrate surfaces while inserting the backer rod or bond breaker tape.
- F. Do not rupture the skin of the closed-cell backer rod during installation. Do not cut rod lengthwise as substitute for smaller diameter rod. Remove any rod containing punctures and prepare the surfaces again.
- G. If primer is needed, as determined by the sealant adhesion testing apply primer after backer rod installation. If used, primer must be demonstrated through successful mockups not to stain or darken the particular brownstone on the building. Apply primer to clean, dry substrates at ambient temperatures above 45°F.
 - 1. Pour primer into a clean container for use. Do not pour more than a 10 min. supply into container to prevent deterioration.
 - 2. Replace cap on primer can immediately after pouring. Remove from the site any primer that contains a white precipitate or that has thickened.
 - 3. Apply primer with a clean brush. Do not apply primer to exposed surfaces beyond sealant. Mask all surfaces before priming, except where surface irregularities will allow the primer to wick beneath the masking tape. Use only one coat of primer. Do not apply primer in a thick layer, which will form a white, powdery film. Remove any films with a clean, dry, lint-free cloth and repair in accordance with manufacturer's written recommendations.
 - 4. Allow primer to dry. Do not allow primer to become wet before sealant application.

3.04 SEALANT APPLICATION

- A. Configure the sealant joints to avoid three-sided adhesion at all sealant joints.
 - 1. For typical butt sealant joints, place the backer rod or bond breaker so the sealant depth measured at the center of the joint after tooling is one-half of the sealant joint width, with a minimum depth of 1/4 in. and a maximum depth of 1/2 in.
 - 2. At fillet (triangular) joints, extend the sealant at least 3/8 in. onto the substrate beyond the bond breaker tape or backer rod and at least 5/8 in. onto the substrate perpendicular to the tape or rod. The minimum thickness between the edge of the tape or rod and surface of the sealant joint shall be at least 1/4 in.
- B. Inspect each cartridge or container of sealant before use and verify that the production date is within six months of the date of application. Remove from the site all sealant

- more than six months old. Each applicator shall understand the method of coding the production date on the cartridge.
- C. Mask all exposed surfaces, not marked for priming, along joint before applying sealant.
 - D. Recheck correct backer rod and bond breaker tape positioning before applying sealant.
 - E. Apply sealant only to clean, dry, primed surfaces (where required) at ambient temperatures above 45°F. Seal joints within 10 min. of primer application.
 - F. Fill all joints solidly and continuously with sealant, neatly applied with a standard caulking gun in a continuous motion, using a slight pressure. "Push" the sealant bead ahead of the nozzle; do not "drag" the nozzle.
 - G. Within 5 min. of sealant application and before skin develops on sealant:
 - 1. Dry tool the joint surface with a concave tool to ensure intimate contact with substrate and to eliminate air bubbles. Do not use any liquid for tooling. Provide a smooth, uniform finished surface.
 - 2. At sealant in reglets, broadcast sand onto the surface of the sealant joint evenly along the length of the joint. If pigment is used in the pointing mortar, mix the sand with the pigment used in the pointing mortar and mix together well to provide a uniform color.
 - H. Remove masking tape within 10 min. of tooling. Avoid contaminating adjacent surfaces with excess sealant. Remove all traces of smears and droppings on smooth finished surfaces promptly, using a solvent recommended by the sealant manufacturer that will not damage or discolor the building surfaces. Remove smears and droppings on porous surfaces by mechanical means after the initial cure of the sealant.
 - I. Coordinate work with other trades to prevent contamination of fresh sealant by dust or other debris.

3.05 CLEANUP

- A. Keep roof areas and other project areas clean of accumulating debris; clean work areas on a daily basis.

END OF SECTION