PROJECT MANUAL

High School Tennis Court Replacement
Regional School District 18

January 3, 2020

Lyme Old Lyme Schools
49 Lyme Street
Old Lyme, CT 06371

Ian Neviaser, Superintendent

Holly McGalla, Business Manager

John Rhodes, Director of Facilities

Prepared by:

BSC GROUP

300 Winding Brook Drive
Glastonbury, CT 06033

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REGIONAL SCHOOL DISTRICT 18
OLD LYME, CONNECTICUT

January 3, 2020

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High School Tennis Court Replacement
Regional School District 18
Information to Bidders

Regional School District No. 18, acting by its Board of Education (the "Board") will accept bids for the following contract:

Name of Contract:	High School Tennis Court Replacement
Addresses:	Lyme Street Campus 69 Lyme Street, Old Lyme, CT 06371
Bids will be received until:	
Date:	Thursday, January 30, 2020
Time:	10:00AM
Submit questions to:	rhodesj@region18.org
Questions Deadline:	January 24, 2020
Submit bids to:	John Rhodes, Director of Facilities and Technology Regional School District No. 18 Administrative Office 49 Lyme Street Old Lyme, CT 06371
Type of bid:	Sealed

Mandatory Pre-Bid Meeting: Not required. However, appointments to visit the schools can be made by calling 860-434-8182.

Instructions: All bidders must carefully familiarize themselves with the following bid specifications and any other contract documents related to the work. Bidders choosing to submit a bid must fill out the Bid forms attached hereto. Failure to comply with each and every specification or requirement shall result in rejection of the bid.

Persons choosing not to bid must fill out the No Bid Response Form in order to be certain of staying on Regional School District No. 18's solicitation list.

January 3, 2020

I. Instructions to Bidders

I.1. These bid specifications accompany all contracts for supplies, services and construction for the Board of Education for Regional School District No. 18. (The District and its Board of Education are collectively referred to herein as the "Board".)

I.2. Certain of these specifications will apply only to certain types of contracts, as will be apparent from the content.

I.3. The Board has provided information about the contracts on the Cover sheet. These Bid Specifications may also be accompanied by other contract documents depending on the type of contract. Bidders should review those carefully and include with their bid any additional sheets that are to be filled out, including alternates and unit prices.

I.4. Costs that are incurred in the development of all bid responses are the responsibility of the Bidder and cannot be charged back to the Board.

I.5. The Board is exempt from the payment of Federal Excise Taxes and Connecticut Sales and Use Tax. These taxes and fees must not be included in bid prices or added to any items specified.

I.6. All bids must be made on the attached bid forms. To be responsive this bid must be properly executed, accompanied by the appropriate bid security and accompanied by any additional bid sheets required by the contract documents.

I.7. Unless otherwise indicated, specification references to commercial types, styles, trade names and catalogues are intended to be descriptive only, not restrictive, and indicate to the bidders the type and quality of articles considered satisfactory. Each bid shall be accompanied by the manufacturer's date covering the item on which the bid is submitted. The required information shall be quoted on the specification sheet. If more space is required, please submit an attachment and reference the item number of the item and a description of the proposed alternate. If the item differs from the minimum specifications set forth, a letter shall accompany the proposal outlining the variance; otherwise, it will be assumed that the proposal conforms strictly to these specifications. The name and address of the proposed manufacturer must accompany the proposal. Rights of substitution shall cease upon acceptance of the proposal by the Board. In the event there is ambiguity or question as to what type of equipment or material the bidder has proposed, the higher quality item shall be required.

I.8. If you propose a substitution, you must indicate in your bid substitutions identified by name or catalogue number and the net difference in cost to the Board. Listed substitutions will be considered for approval only after the award of the contract; the Board reserves the right to require the originally specified material or equipment at the

price submitted by the bidder in his bid, notwithstanding the fact that the bidder may have based a price for a specific item on a proposed substitution. In this regard, the Board shall make its determination made in good faith, on the basis of the quality and type of the article listed. Any benefit in price reduction due to a substitution shall accrue to the Board.

I.9. All products must conform to strict OSHA standards as required by law. Ingredients contained in products shall conform to Federal and State of Connecticut Regulations and State of Connecticut statutes governing safety of product for use in our schools. Certifications of compliance to these standards may be required to be submitted by the bidder awarded the contract.

I.10. Bidders shall include in their proposals the names of all subcontractors who are proposed to participate in the work

I.11. The undersigned acknowledges that it has carefully examined all of the contract documents bound in with this bid, including any addenda, has participated in any site visit and is familiar with any factors which may affect this contract, and offers to perform, in strict conformity with each and every provision of the contract at the prices set forth in this bid and within the period of time specified for completion in the contract documents. This offer shall be irrevocable for a period of 60 days from the date of bid opening.

I.12. By submission of this bid, the undersigned and each person signing on behalf of the undersigned certifies, under penalty of perjury, that: (a) the prices in this bid have been arrived at independently, without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (b) unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the undersigned and will not knowingly be disclosed by the undersigned prior to opening, directly or indirectly to any other bidder or to any competitor; (c) no attempt has been or will be made by the undersigned to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

I.13 Connecticut Prevailing Wage and Benefit laws apply to this Project. All Bidders shall include prevailing wage rates and benefits and yearly adjustments in their bids pursuant to Connecticut General Statutes §§ 31-53 through 31-55a. Certified payrolls will be required from the successful bidder to ensure compliance with Connecticut's Prevailing Wage laws.

II. Bidding Procedure

II.1. Bids will be accepted until the date and time indicated on the Cover Sheet. Any received after the date and time specified, or an authorized extension thereof, will not be considered.

II.2. Bids shall be in sealed envelopes with the bidder's name in the upper left corner and the name of bid and the time and date of bid opening in the center of the envelope. Two original executed copies of all the bid papers must be included in the envelope. All bid documentation must be readable and legible.

II.3. Bids may not be sent by fax or any other electronic means.

II.4. No bid will be accepted as valid unless submitted on official bid forms, as provided to all bidders, and properly and completely executed with all attachments as required.

II.5. Any bid may be withdrawn prior to the scheduled bid opening as indicated on the specification Cover Sheet or prior to an authorized postponement date thereof.
No bidder may withdraw its bid for a period of 60 days following the actual time of bid opening.

II.6. Bidders are required to make any site visits indicated on the Cover Sheet.

II.7. The submission of the bid shall serve as conclusive evidence that the bidder has satisfied himself/herself as to all requirements outlined in the bid specifications and documents and to all conditions serving to control the execution of any contract which may ensue.

II.8. The failure or omission of any bidder to receive or examine any form, document or location shall in no way relieve the bidder from any obligation in respect to his/her bid.

II.9. The Board reserves the right to modify the specifications contained herein at any time throughout the bidding period. No modification or interpretation of the specifications other than through the issuance of written addenda, however, shall be binding upon the Board.

II.10. No interpretation of the meaning of the specifications or other contract documents will be made to any bidder orally. Any questions by bidders must be submitted in writing to the Email address and before the deadline listed on the Cover Sheet. If appropriate, the Board will respond via Email by addenda to the recorded Email addresses of the pre-bid meeting attendees. Failure of any bidder to receive any such addenda shall not relieve any bidder from any obligations under his/her bid as submitted. All addenda issued will become part of the contract documents.

II.11. Bidders must include a letter from their insurance company indicating their insurability in the amounts indicated by the Insurance Requirements in Article 5 of the Agreement (AIA A105-2017).

II.12. Bidders are required to submit written evidence of compliance with the rules and regulations of the Equal Employment Opportunity Commission and their policy on affirmative action.

II.13. Bid Bond - All bidders are required to provide bid security in the penal amount of Ten Percent (10%) of their bid in the form of a Bid Bond (AIA A310-2010) or certified check in favor of Regional School District No. 18. In the event the bidder is awarded a contract by Regional School District No. 18 and fails to execute that contract, the bidder shall forfeit such bid security.

II.14. Performance and Payment Bonds - The bidder shall include the cost of a performance and labor and material payment bond (AIA 312-2010 or equivalent) in its bid in the penal amount of One Hundred Percent (100%) of the contract value with a surety acceptable to Regional School District No. 18. The Bonds shall conform to the requirements of the Little Miller Act Conn. Gen. Stat. 49-41, et seq.

III. Review and Award of Bid

III.1. The Board reserves the unqualified right to accept or reject any and all bids, in whole or in part.

III.2. The Board reserves the right to negotiate with any bidder prior to award.

III.3. The Board reserves the right to waive any technicalities and informalities in bids.

III.4. The Board may reject any bid deemed non-responsive or conditional.

III.5. The Board reserves the right to consider non-financial conditions, as well as bid price, when it is deemed to be in its best interest to do so.

III.6. Each party receiving or acquiring this bid package acknowledges that, in awarding the ultimate contract, the Board will exercise discretion in making its final decision. Each party submitting a bid does so recognizing that no cause of action or claim will arise in such party's favor against the Board, or any person, firm, corporation or other legal entity engaged by the Board to assist in making the final decision, as a result of the exercise of such discretion.

III.7. The Board may make such investigations as it deems necessary to determine the ability, qualifications and experience of the bidder to perform the work. The bidder shall furnish to the Board all such information and data for the purpose as the Board may request.

III.8. If no responsive bids are received, the Board reserves the right to negotiate with all responsible bidders for the award of the contract.

III.9. In the event that only one bid is received, a price or cost analysis may be made before the award of the contract. A price analysis is the process of comparing the bid to other similar procurement. Where it is impossible to conduct a valid price analysis, it may be necessary to conduct a cost analysis of the bid price. The single bidder will then be required to provide sufficient information and data so that this analysis can be made.

III.10. The successful bidder will be required to execute AIA A105-2017 which will be the "Agreement" between the Owner (Regional School District 18) and the Contractor.

BID FORM

Submit two completed forms

PROJECT IDENTIFICATION:

High School Tennis Court Replacement
Regional School District 18
Lyme Old Lyme Schools
49 Lyme Street
Old Lyme, CT 06371

THIS BID IS SUBMITTED TO OWNER:

John Rhodes, Director of Facilities
Lyme Old Lyme Schools
49 Lyme Street
Old Lyme, CT 06371

THIS BID IS SUBMITTED BY:

_____

(Company Name)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner (form to be negotiated) to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
2. Bidder accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.
3. Bidder understands the execution of an Agreement shall be deemed executory only to the extent that appropriations are available for the specified scope of work.
4. In submitting this Bid, Bidder represents that:
   A. Bidder has examined and carefully studied the Bidding Documents entitled **"High School Tennis Court Replacement, Regional School District 18"**, dated **January 3, 2020** the other related data identified in the Bidding Documents and the following Addenda, receipt of which is hereby acknowledged

(enter data as appropriate)

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____

B. The Bidder agrees that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
C. Bidder has examined copies of, and familiarized itself with, the nature and extent of the Contract Documents, Work, project site, locality, and all local conditions, laws and regulations, and schedule that in any manner may affect cost, progress, performance or furnishing of the Work.
D. Bidder is familiar with and is satisfied as to all Federal, State and local Laws and Regulations that may affect cost, progress and performance of the Work.
E. Bidder has obtained and carefully studied (or accepts the consequences for not doing so) all reports of explorations, tests, examinations, investigations, studies and data concerning physical conditions at the project site which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto as Bidder considers necessary for performance of furnishing the Work at the contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents.
F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
G. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

5. Bidder agrees that the Work will be substantially completed and ready for final payment on or before the dates or within the number of calendar days indicated in the Agreement.
6. Bidder proposes to furnish all labor and materials required for the project in accordance with the accompanying Bidding Documents for the Contract Prices specified below, subject to additions and deductions per the terms of the Bidding Documents.
7. Bidder proposes the following:
   All blank spaces must be filled in, in ink and in both words and figures where required. No changes shall be made in the wording or numbering. Written amounts shall govern where the amount stated in writing and the amount stated in figures does not agree.

BASE BID

BID ITEM 1 – TENNIS COURT CONSTRUCTION

The Total Proposed **Lump Sum Contract Price** (exclusive of deduct/add alternates) for this Bid Item is:

_____ **dollars (words)**

$ _____ **(figures)**

ALTERNATE BID ITEMS

ALTERNATE 1 – CONCRETE BLEACHER PADS

The proposed **Lump Sum Contract Price** for this Alternate Bid Item is:

Add _____ dollars (words)

Add $ _____ (figures)

ALTERNATE 2 – PORTABLE BLEACHERS

The proposed **Lump Sum Contract Price** for this Alternate Bid Item is:

Add _____ dollars (words)

Add $ _____ (figures)

ALTERNATE 3 – WINDSCREEN WITH LOGO

The proposed **Lump Sum Contract Price** for this Alternate Bid Item is:

Add _____ dollars (words)

Add $ _____ (figures)

8. In submitting this proposal, Bidder agrees to the following:
   A. This bid will remain subject to acceptance for **sixty (60) days** after the Bid due date. Bidder will sign and submit the agreement with the Bonds, Insurance Certificate, and other documents required within ten (10) days after the date of Owner's Notice of Award.
   B. To enter into an Agreement with the Owner which shall constitute a valid and binding Contract, in the form included in the Project Manual (AIA A105-2017) to perform and furnish all work as specified or indicated in the Contract Documents for the Contract Price and within the Contract time indicated in this bid and in accordance with the other terms and conditions of the Contract Documents.
   C. To accomplish the work in accordance with the Contract Documents.
   D. To begin and complete the Work in accordance with the dates and/or contract times indicated in the Bidding Document.
9. Bidder hereby certifies that:
   A. That this Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
   B. Bidder has not induced or solicited any person, firm or corporation to refrain from bidding. Bidder has not sought by collusion to obtain for itself any advantages over any other Bidder or over Owner.

C. Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that Bidder will comply fully with all applicable laws and regulations.
D. Bidder is not presently debarred from doing public construction work in the State of Connecticut under the provisions of or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.
E. That Bidder has filed all State tax returns and paid all State taxes required by law.
F. That this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. as used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.
G. Bidder shall submit written evidence of its authority to do business in the State where the Project is located not later than the date of its execution of the Agreement.

10. Bidder further represents that:
    A. This bid is genuine and not made in the interest of or on the behalf of any undisclosed individual or entity;
    B. Bidder has not directly or indirectly induced or solicited any other bidder to submit a false or sham bid;
    C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
    D. Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over owner.
11. Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder, and the right to disregard all non-conforming, non-responsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make and award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner.
12. Bidders are hereby notified that prior to award of a contract, contractor must complete the State of Connecticut Contractor Verification in accordance with Public Act 16-67.

Documents Included:

Two (2) executed copies of this Bid Form ☐
Bidder's Statement of Qualifications and Reference Form ☐
Non-Collusion Affidavit of Prime Bidder ☐
Certificate as to Corporate Principal ☐
Insurance company confirmation of insurability (per Bidding Procedures) ☐
Bid Bond (per Bidding Procedures) ☐

This Bid Hereby Submitted:

Date: _____

_____
(Print Name of Firm Submitting Bid)

_____
(Signature of Authorized Representative)

_____
(Print Name and Title of Authorized Representative)

_____
(Business Address)

Federal Identification Number:

_____

_____
(City, State and Zip Code)

_____
Phone No.:

_____
E-mail:

BIDDER'S STATEMENT OF QUALIFICATIONS

Complete this form. All questions must be answered and the data given must be clear and comprehensive. If necessary, questions may be answered on separate sheets. Substitutes for this form shall not be accepted.

Attachments:

1. Complete the attached References Form.

Qualifications:

It is the intent of Regional School District 18 to engage a contractor with extensive experience in the construction of post-tensioned concrete tennis courts. As such, the successful bidder shall meet the following minimum requirements:

a. Qualified responsible general bidders, or their tennis court sub-contractor shall have completed at a minimum five (5) projects including post-tensioned concrete courts that are a maximum of five (5) years old relative to the date of substantial completion as of the date of bid.

b. Qualifications shall be by the general contractor/successful bidder performing the work and/or the tennis court sub-contractor. Regional School District 18 maintains sole discretion regarding the evaluation and acceptance of bidder's qualifications.

Information Required (*type or print clearly in blue or black ink*)

1. Name of Contractor.

_____

2. Permanent main office address.

_____

_____

_____

3. When were you organized (month/year): _____

4. How many years have you been engaged in the contracting business under your present firm or trade name?

   _____years

5. If a corporation, indicate the following:

   Date of Incorporation: _____ State or Incorporation: _____

   President (or other chief executive as applicable): _____

6. If a Partnership, indicate the following:

   Date of Organization: _____

   Type of Partnership: _____

   Names and Addresses of Partners/Officers:

   1. _____ 2. _____

   3. _____ 4. _____

   5. _____ 6. _____

7. General character of work performed by your company.

8. Have you ever failed to complete a project? If yes, identify the project(s) and provide an explanation.

9. Have you ever defaulted on a contract? If yes, identify the project(s) and provide an explanation.

10. Contracts on hand: (Show the contract amount of each contract and the anticipated date of completion; attach additional sheets if necessary.)

    1.
    2.
    3.
    4.
    5.
    6.
    7.
    8.
    9.
    10.

11. List your major equipment available for this Contract.

_____

_____

_____

_____

_____

12. List the work to be performed by subcontractors and summarize the dollar value of each subcontract.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

13. Do you have adequate resources to complete the project within the required schedule and/or by the required completion date? Yes ☐ No ☐

14. Complete the attached **References Form** to list (at a minimum) references for projects completed, surety company reference, and bank reference. Yes ☐ No ☐

15. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by Regional School District 18?

The undersigned hereby authorizes and requests any persons, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of 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 is _____ of

and that the answers to the foregoing questions and all statements therein are true and correct

and sworn under penalties of perjury.

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

(Notary Seal)

_____
(Notary Signature)

My Commission Expires:_____

REFERENCES

The Bidder is required to fill out the following form to enable the Town to make inquiries and judge as to the Bidder's experience, skill, available financial resources, credit, and business standing.

ITEM 1

List five (5) projects of similar nature to the project described herein that the Bidder has completed, with name, address, and telephone number of a reference for each project. Include approximate construction cost:

Project 1: _____

Brief Description: _____

Contract Value: _____ Date Completed: _____

Reference:

Name: _____ Phone No. _____

Address: _____

Project 2: _____

Brief Description: _____

Contract Value: _____ Date Completed: _____

Reference:

Name: _____ Phone No. _____

Address: _____

Project 3: _____

Brief Description: _____

Contract Value: _____ Date Completed: _____

Reference:

Name: _____ Phone No. _____

Address: _____

Project 4: _____

Brief Description: _____

Contract Value: _____ Date Completed: _____

Reference:

Name: _____ Phone No. _____

Address: _____

Project 5: _____

Brief Description: _____

Contract Value: _____ Date Completed: _____

Reference:

Name: _____ Phone No. _____

Address: _____

ITEM 2

List name, address, and telephone number for the following:

Surety 1: _____

Address: _____

Contact Name: _____ Phone No. _____

Surety 2: _____

Address: _____

Contact Name: _____ Phone No. _____

Bank: _____

Address: _____

Contact Name: _____ Phone No. _____

No Bid Response Form

Contractor Name _____

Contractor Address _____

Contractor City, State, Zip Code _____

Contractor Telephone _____

Contractor Fax _____

Bid Contract Name _____

Reasons for Not Bidding on the Referenced Contract:
(Check all that apply)

_____ 1. Contractor acquired plans as a potential subcontractor only.

_____ 2. Size of this contract is not within the interest of contractor.

_____ 3. Contractor had an insufficient amount of time to prepare bid. (Please give the date that the contractor acquired plans and specifications and any other pertinent information.

_____ 4. Contract work not within the specialty of the Contractor. (Please cite Contractor's area of specialty.)

_____ 5. Other. (Please explain in comment section below.)

Comments (Please use additional sheets if necessary):

_____ _____
Signature Title

CERTIFICATE AS TO CORPORATE PRINCIPAL

NOTE: This certificate must be executed by an individual other than the person signing the Bid.

If applicable, all documents should be executed as the parent company, doing business as:

Parent Company: _____

dba: _____
(If different than parent company)

Project: **High School Tennis Court Replacement, Regional School District 18**

I, _____, certify that I am _____
(Print/type name) (Office Held)

of the corporation that has been named as principal in the Bid; that

_____ who signed said Bid on behalf of the principal is
(Print/type name)

_____ of said corporation, and I hereby certify that
(Office Held)

Such individual under and pursuant to the by-laws and resolutions of said corporation, including the foregoing assurance of irrevocability, is fully and completely authorized so to do.

_____
(Signature)

(Corporate Seal)

_____
(Print/type name)

Witness this _____ day of _____ 2016.

_____
Notary Public

(Notary Seal) My Commission expires _____

Non-Collusion Statement

State of _____)
_____)
County of _____)

_____, being first duly sworn, deposed and says:

that he/she is (Board, partner, officer, representative or agent) _____

of _____; the bidder that has submitted the attached

(Organization Name)

bid titled **"High School Tennis Court Replacement".** He/she is fully informed respecting the preparation and contents of the attached bid and all other circumstances of the bid. The submitted bid is genuine and is not a sham or collusive bid. This bid has been independently arrived at without collusion with any other bidder or with a competitor or potential competitor. This bid has not been knowingly disclosed and will not be knowingly disclosed prior to the opening of bids for work to be performed or goods to be sold, to any other bidder, competitor or potential competitor. No attempt has been made or will be made to induce any other person, partnership or corporation to submit or not to submit a bid. The person signing this bid certifies that he/she has fully informed himself/herself regarding the accuracy of the statements contained in this certification and, under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in his/her behalf. The price or prices quoted in the attached bid are proper, fair and not tainted by any collusion, conspiracy or unlawful agreement, representatives or parties of interest.

(Signed) _____

(Title) _____

Subscribed and sworn to before me this _____ day of _____, _____.

_____ Notary Public

My commission expires _____.

AGREEMENT

AIA® Document A105™ – 2017

Standard Short Form of Agreement Between Owner and Contractor

AGREEMENT made as of the day of in the year 20
(In words, indicate day, month and year.)

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

Regional School District No. 18
49 Lyme Street
Old Lyme CT 06371

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

.
.

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

Lyme Old Lyme High School Tennis Court Replacement
Lyme Street Campus
69 Lyme Street, Old Lyme, CT 06371

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

BSC Group
300 Winding Brook Drive
Glastonbury, CT 06033

The Owner and Contractor agree as follows.

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

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contractor shall complete the Work described in the Contract Documents for the Project. The Contract Documents consist of

.1 this Agreement signed by the Owner and Contractor;

.2 the drawings and specifications prepared by the Architect, dated , and enumerated as follows:

Drawings:

Number	Title	Date

Specifications:

Section	Title	Pages

.3 addenda prepared by the Architect as follows:

Number	Date	Pages

.4 written orders for changes in the Work, pursuant to Article 10, issued after execution of this Agreement; and

.5 other documents, if any, identified as follows:

Owner's Information to Bidders dated October 22, 2019, attached hereto as Exhibit A.

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The Contract Time is the number of calendar days available to the Contractor to substantially complete the Work.

§ 2.2 Date of Commencement:

Unless otherwise set forth below, the date of commencement shall be the date of this Agreement.
(Insert the date of commencement if other than the date of this Agreement.)

§ 2.3 Substantial Completion:

Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion, as defined in Section 12.5, of the entire Work:
(Check the appropriate box and complete the necessary information.)

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

[X] By the following date: All Work must be performed and completed between June 1, 2020 and August 21, 2020. The Contractor may commence all administrative portions of the Work, such as submittals, shop drawings, etc. upon award of the Contract in preparation to perform the physical installation between one of the two aforementioned periods.

§2.4 Liquidated Damages. If the Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the terms of this Agreement then the Contractor does hereby agree, as part consideration for the awarding of this Contract, to pay the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work the sum of _____ Dollars ($_____) per calendar day. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, the said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

Liquidated Damages apply to this Agreement [ ] Yes; [x] No.

ARTICLE 3 CONTRACT SUM

§ 3.1 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work. Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

($)

§ 3.2 For purposes of payment, the Contract Sum includes the following values related to portions of the Work:
(Itemize the Contract Sum among the major portions of the Work.)

Portion of the Work	Value
Not Applicable	

§ 3.3 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner:
(Identify the accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 3.4 Allowances, if any, included in the Contract Sum are as follows:
(Identify each allowance.)

Item	Price

§ 3.4.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents.

§ 3.4.2 Unless otherwise provided in the Contract Documents,
.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the allowances; and
.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowance.

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

§ 3.5 Unit prices, if any, are as follows:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

ARTICLE 4 PAYMENTS

§ 4.1 Based on Contractor's Applications for ~~Payment certified by the Architect, the Owner~~ Payment, the Owner, who may in its sole discretion consult with the Architect, if any, concerning the Contractor's Application for Payment shall pay the Contractor, in accordance with Article 12, as follows:
(Insert below timing for payments and provisions for withholding retainage, if any.)

§ 4.1.1 The Owner shall make payment of the amount approved by Owner to the Contractor not later than thirty (30) calendar days after the date upon which the Owner approves all or part of the Contractor's Application for Payment.

§ 4.1.2 Each Application for Payment shall be based on the most recent schedule of values or unit prices submitted by the Contractor in accordance with the Contract Documents. The schedule of values or unit prices shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values or unit prices shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule of values, or unit prices unless objected to by the Owner shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 4.1.4 Subject to other provisions of the Contract Documents, the amount of each progress payment for amounts designated as lump sums shall be computed as follows:

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum set forth in the schedule of values for items designated as lump sums in the Agreement; or multiplying the actual in place quantity of Work by the applicable unit price. All payments based upon either a lump sum or unit price shall be subject to retainage of five percent (5.0%).

.2 If applicable, add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitable stored off the site at a location agreed upon in writing), less retainage of five percent (5.0%) on the Work;

.3 Subtract the aggregate of previous payments made by the Owner; and,

.4 Subtract amounts, if any, for which the Owner or Architect has withheld or nullified a Certificate for Payment

§ 4.2 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate below, or in the absence thereof, at the legal rate prevailing at the place of the Project.
(Insert rate of interest agreed upon, if any.)

Not Applicable. No interest shall apply or be paid under this Agreement or at law. %

§ 4.3.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when the Project in fully and finally completed as determined by the Owner.

§ 4.3.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the Owner approves the Contractor's final Application for
~~ARTICLE~~ **Payment.**

ARTICLE 5 INSURANCE

§ 5.1 The Contractor shall maintain the following types and limits of insurance until the expiration of the period for correction of Work as set forth in Section 14.2, subject to the terms and conditions set forth in this Section 5.1:

~~§ 5.1.1 Commercial General Liability insurance for the Project,~~ General Liability	Each Occurrence General Aggregate Products/Completed Operations Aggregate	$1,000,000 $2,000,000 $2,000,000
Professional Liability	Each Claim or Each Occurrence Aggregate	$1,000,000 $1,000,000
Auto Liability	Combined Single Limit Each Accident	$1,000,000
Umbrella (Excess Liability)	Each Occurrence Aggregate	$5,000,000 $5,000,000

~~written on an occurrence form, with policy limits of not less than ($) each occurrence, ($) general aggregate, and ($) aggregate for products-completed operations hazard.~~ If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

~~§ 5.1.2 Automobile~~ Workers' Compensation: Statutory Limits
~~Liability covering vehicles owned, and non-owned vehicles used, by~~ Employers' Liability EL Each Accident $1,000,000
EL Disease Each Employee $1,000,000
EL Disease Policy Limit $1,000,000

~~the Contractor, with policy limits of not less than (($) per accident, for bodily injury, death~~ Original, completed Certificates of Insurance must be presented to the Owner prior to Contract issuance. Contractor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration date of the policies.

~~of any person, and property damage arising out of the ownership, maintenance, and use of those motor vehicles along with any other statutorily required automobile coverage.~~The Owner, the Regional School District No. 18 Board of Education, the Architect and the Architect's consultants, if any and their respective agents, employees, officers, members, volunteers and affiliated entities (collectively, the "Additional Insureds") shall be named as an additional insured on the Contractor's insurance policy(ies). The Contractor shall include a provision in its agreements with its Subcontractors requiring that the Additional Insureds be named as additional insureds on the Subcontractor's insurance policies. The insurance of the Contractor and the insurance of the Contractor's Subcontractors shall be primary to any

~~§ 5.1.3 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided that such primary and excess or umbrella insurance policies result in the same or greater coverage as those required under Section 5.1.1 and 5.1.2, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require exhaustion of the underlying limits only through the actual payment by the underlying insurers.~~insurance available to the Additional Insureds, which insurance shall be secondary and non-contributory. The Contractor shall, before commencement of its Work, and prior to the commencement of the Work of any of its Subcontractors, submit to the Owner evidence of the aforementioned insurance requirements from itself and its Subcontractors in the form of a certificate of insurance and additional insured endorsements or actual insurance policies containing a blanket additional insured clause acceptable to the Owner. Failure by the Contractor to provide the endorsements required in this section shall entitle the Owner to withhold payment from any Application for Payment then due or to become due until such time as the endorsements are provided.

See above

See above

See above

~~§ 5.1.4 Workers' Compensation at statutory limits.~~
See above

~~§ 5.1.5 Employers' Liability with policy limits not less than ($) each accident, ($) each employee, and ($) policy limit.~~ See above

§ 5.1.6 The Contractor shall provide builder's risk insurance to cover the total value of the entire Project on a replacement cost basis.

§ 5.1.7 Other Insurance Provided by the Contractor
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

§ 5.2 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance and shall provide property insurance to cover the value of the Owner's property. The Contractor is entitled to receive an increase in the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance.

§ 5.3 The Contractor shall obtain an endorsement to its Commercial General Liability insurance policy to provide coverage for the Contractor's obligations under Section 8.12.

§ 5.4 Prior to commencement of the Work, in addition to the proof for the additional insured requirements set forth above, each party shall provide certificates of insurance showing their respective coverages.

§ 5.5 ~~Unless specifically precluded by the Owner's property insurance policy, the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, suppliers, agents, and employees, each of the other; and (2) the Architect, Architect's consultants, and any of their agents.~~ The Contractor and the Contractor's Subcontractors and Suppliers waive all rights of subrogation against the Owner, Regional School District No. 18 Board of Education, the Architect and the Architect's consultants, if any, and their respective agents, employees, officers, members, volunteers and affiliated entities.

~~and employees, for damages caused by fire or other causes of loss to the extent those losses are covered by property insurance or other insurance applicable to the Project, except such rights as they have to the proceeds.~~ **§ 5.6** The Contractor shall provide to the Owner a 100% Performance and Labor and Materials Payment Bond in a form acceptable to the Owner from a Surety licensed to do business in the State of Connecticut and acceptable to the Owner.

~~of such insurance.~~ **§ 5.7** The insurance provisions of this Agreement shall survive termination and/or full or partial performance of the Agreement.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 The Contract

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 The Work

The term "Work" means the construction and services required by the Contract Documents, and includes all other labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. The Work shall be deemed to include, in the reasonable opinion of the Owner, who may consult with the Architect, if any, all items reasonably inferable from the Contract Documents.

§ 6.3 Intent

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

§ 6.4 Ownership and Use of Architect's Drawings, Specifications and Other Documents

Documents prepared by the ~~Architect~~ Architect, if any, are instruments of the Architect's service for use solely with respect to this Project. The ~~Architect~~ Architect, unless stated otherwise in the contract between Owner and Architect, if any, shall retain all common law, statutory, and other reserved rights, including the copyright. The Contractor, subcontractors, sub-subcontractors, and suppliers are authorized to use and reproduce the instruments of service solely and exclusively for execution of the Work. The instruments of service may not be used for other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the ~~Architect.~~ Architect, if any or the Owner, as the case may be.

§ 6.5 Electronic Notice

Written notice under this Agreement may be given by one party to the other by email as set forth below.
(Insert requirements for delivering written notice by email such as name, title, and email address of the recipient, and whether and how the system will be required to generate a read receipt for the transmission.)

To be determined

ARTICLE 7 OWNER

§ 7.1 Information and Services Required of the Owner

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all necessary surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees under Section 8.7.1 that are the responsibility of the Contractor, the Owner shall obtain and pay for other necessary approvals, easements, assessments, and charges.

§ 7.1.3 ~~Prior to commencement of the Work, at the written request of the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence.~~Intentionally Omitted.

§ 7.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work which is not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

§ 7.3 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ~~seven~~ three day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies. In such case, the ~~Architect~~ Owner or Architect, if any, may withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the cost of ~~correction, provided the actions of the Owner and amounts charged to the Contractor were approved by the Architect.~~correction.,

§ 7.4 Owner's Right to Perform Construction and to Award Separate Contracts

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

ARTICLE 8 CONTRACTOR

§ 8.1 Review of Contract Documents and Field Conditions by Contractor

§ 8.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the ~~Architect.~~ Architect, if any and the Owner. The Contractor's obligations herein are for the purpose of discovering errors and omissions or adverse field conditions. In the event the contractor fails to promptly report any known error, omission or adverse field condition and commences the Work, the Contractor shall be responsible for all costs associated with any re-work or correction.

§ 8.2 Contractor's Construction Schedule

The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and ~~Architect's~~ Architect's, if any, information a Contractor's construction schedule for the ~~Work.~~Work in critical path method format. The Contractor shall update and submit for the Owner's information an updated schedule at least once every thirty (30) days with each of the Contractor's Application for Payment, or sooner if required by Project conditions as may be reasonably requested by the Owner. Failure of the Contractor to submit an updated schedule as provided herein shall entitle the Owner to suspend all payment obligations to the Contractor until the Contractor complies with the provisions herein.

§ 8.3 Supervision and Construction Procedures

§ 8.3.1 The Contractor shall supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner, through the Architect, if any, the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner or ~~Architect~~ Architect, if any, have made a timely and reasonable objection.

§ 8.4 Labor and Materials

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

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

§ 8.5 Warranty

The Contractor warrants to the Owner and ~~Architect~~ Architect, if any, that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Any material or equipment warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 12.5.

§ 8.5.1 The Contractor shall provide copies of all fully executed warranties and guarantees required by the Contract Documents within ten (10) days of the date of Substantial Completion or as otherwise provided for Work accepted before or after such date.

§ 8.5.2 All warranties shall commence as of the date of Substantial Completion of the Work, and shall continue for a period of one (1) year or longer as required by the Contract Documents. In no event shall the commencement of the use of building systems be deemed to commence the term of any warranty unless the Owner has, at that time, actually commenced beneficial use of the Project.

§ 8.5.3 Substitutions not properly approved and authorized by the Owner, who may consult with the Architect, if any, shall be considered defective.

§ 8.5.4 Work, materials or equipment which fails to perform under the proper use and normal wear for intended purposes for a period of one year after the date of Substantial Completion, except where warranties for longer durations are called for by the Contract Documents, shall be considered defective.

§ 8.5.5 Longer term or extended warranties required by the Contract Documents shall be provided by the relevant Subcontractor, vendor or manufacturer directly to the Owner, and the Contractor shall obtain documentation of such warranties and transmit such documentation to the Owner for review and approval.

§ 8.6 Taxes

The Contractor shall pay sales, consumer, use, and similar taxes that are legally required when the Contract is executed.

§ 8.7 Permits, Fees and Notices

§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work.

§ 8.7.2 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and

regulations, or lawful orders of public authorities, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the ~~Architect~~ Owner and Architect, if any, in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

§ 8.8 Submittals

The Contractor shall promptly review, approve in writing, and submit to the ~~Architect~~ Architect, if any, and Owner shop drawings, product data, samples, and similar submittals required by the Contract Documents. Shop drawings, product data, samples, and similar submittals are not Contract Documents.

§ 8.9 Use of Site

The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents, and the Owner.

§ 8.10 Cutting and Patching

The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 8.11 Cleaning Up

The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material; and shall properly dispose of waste materials. . If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor and withheld from any payment then due or that may become due.

§ 8.12 Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Regional School District No. 18 Board of Education, the Architect, Architect's consultants, if any, and agents and employees of any of them, from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder.

§ **8.12.1** The Contractor shall defend, indemnify and hold harmless the Owner, Regional School District No. 18 Board of Education , the Architect, Architect's consultants, if any, and agents and employees of any of them from any and all losses, costs and expenses, including fines and reasonable attorneys' fees incurred by the Owner, Regional School District No. 18 Board of Education, the Architect, Architect's consultants, if any, and agents and employees of any of them by reason of the violation of such laws, ordinances, regulations and directives, federal, state and local, which are currently in effect or which become effective in the future and caused by the negligence of the Contractor, its Subcontractors or anyone either directly or indirectly employed by any of them.

§ **8.12.2** To the fullest extent permitted by law, the Contractor shall provide a defense to the Owner, Regional School District No. 18 Board of Education, the Architect and Architect's consultants, if any, and their respective employees, agents, volunteers and affiliated entities for any claims concerning, arising out of, or relating to the Contractor's or the Contractor's Subcontractor's operations concerning, the Project whether or not such claim has in part its origin in a claim that the Owner's, Regional School District No. 18 Board of Education's, the Architect's and Architect's consultants', if any, and their respective employees, agents, volunteers and affiliated entities' conduct was in part responsible for said damage, loss or expense. The duty to defend the Owner, Regional School District No. 18 Board of Education, the Architect and Architect's consultants, if any, and their respective employees, agents, volunteers and affiliated entities extends to situations where there is no duty to indemnify or save the Owner, Regional School District No. 18 Board of Education, the Architect and Architect's consultants, if any, and their respective employees, agents, volunteers and affiliated entities harmless for that portion of the claim , loss or damage attributable to the Owner's, Regional School District No. 18 Board of Education's , the Architect and Architect's consultants', if any, and their respective employees, agents, volunteers and affiliated entities' conduct.

§ 8.12.3. The defense and indemnification provisions of this Agreement shall survive termination or full or partial performance of the Agreement.

ARTICLE 9 ARCHITECT

§ 9.0 The term "Architect" is used for convenience in the Agreement. If applicable, the Project will be designed and administered in accordance with the terms of this Agreement by either an architect duly licensed to practice architecture in the state of Connecticut or a registered professional engineer duly licensed to practice engineering in the state of Connecticut. Notwithstanding the foregoing, the Owner is under no duty or obligation to retain an architect or engineer if the Project can be designed and/or administered without doing so in accordance with applicable law.

§ 9.1 The ~~Architect~~ Architect, if any, and/or Owner will provide administration of the Contract as described in the Contract Documents. The ~~Architect~~ Architect, if any, will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The ~~Architect~~ Architect, if any, and if requested by the Owner, will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The ~~Architect~~ Architect, if any, will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility. The ~~Architect~~ Architect, if any, will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 ~~Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor.~~The Architect, if any, may be consulted by the Owner to review the Contractor's Applications for Payment.

§ 9.5 The ~~Architect~~ Architect, if any, has authority to reject Work that does not conform to the Contract Documents.

§ 9.6 The ~~Architect~~ Architect, if any, or Owner will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.7 ~~On written request from either the Owner or Contractor, the Architect will promptly~~ The Architect, if any, at the Owner's election, may interpret and decide matters concerning performance under, and requirements of, the Contract Documents.

§ 9.8 ~~Interpretations and decisions of the Architect~~ If the Owner elects to consult with the Architect, if any, as provided in Section 9.7, the Architect's interpretation will be consistent with the intent of, and reasonably inferable from the Contract Documents, and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

~~§ 9.9 The Architect's duties, responsibilities, and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.~~If the Owner in its sole discretion\elects not to consult with the Architect or if there is no Architect, the Owner's decision shall be final and binding on the Contractor and the Contractor shall continue diligent performance of the Work without interruption subject to the Contractor's rights to dispute resolution.

§ 9.9 Intentionally Omitted.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions, and the Contract Sum and Contract Time ~~shall~~ may be adjusted accordingly, in writing. ~~If~~

§ 10.1 GENERAL

§ 10.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 10 and elsewhere in the Contract Documents.

§ 10.1.2 A Change Order shall be based upon agreement among the Owner, who may consult with the Architect, if any, and Contractor. A Construction Change Directive requires agreement by the Owner and may or may not be agreed to by the Contractor.

§ 10.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order.

§ 10.1.4 The Owner reserves the sole and exclusive right to reduce or remove certain portions of the Contractor's Work after the execution of this Agreement by Change Order or Construction Change Directive.

§ 10.2 CHANGE ORDERS

~~the Owner and Contractor cannot agree~~ § 10.2.1 A Change Order is a written instrument prepared by and signed by the Owner and Contractor stating their agreement upon all of the following:

.1 The change in the Work;

.2 The amount of the adjustment, if any, in the Contract Sum; and

.3 The extent of the adjustment, if any, in the Contract Time.

§ 10.2.2 Methods used in determining adjustments to the Contract Sum will include those listed in Section 10.3.3 below.

§ 10.3 CONSTRUCTION CHANGE DIRECTIVES

§ 10.3.1 A Construction Change Directive is a written order prepared by and signed by the Owner directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 10.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 10.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 10.3.7.

The amount of allowable overhead and profit to the Contractor for an increase in the Cost of the Work shall be 10% of the Contractor's net cost, unless the same is governed by a unit price and if so the unit price shall include all overhead and profit.

§ 10.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner ~~shall pay~~ or Contractor, the applicable unit prices shall be equitably adjusted.

§ 10.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

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

§ 10.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Owner, who may consult with the Architect, if any, shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 10.3.3.3, the Contractor shall keep and present, in such form as the Owner, who may consult with the Architect, if any, may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 10.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

~~the Contractor its actual cost plus~~ § 10.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Owner who may consult with the Architect, if any. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

~~reasonable overhead and profit.~~ § 10.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Owner, who may consult with the Architect, if any, will make an interim determination for purposes of monthly payments for those costs in the Owner's reasonable and good faith judgment, to be reasonably justified.

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

§ 10.2 The ~~Architect~~ Owner or Architect, if any, may authorize or order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. Such authorization or order shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall proceed with such minor changes promptly.

§ 10.3 If ~~concealed or unknown physical conditions are encountered at the site~~ the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or ~~from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to equitable adjustment.~~ (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner before conditions are disturbed and in no event later than 5 days after first observance of the conditions. The Owner will promptly investigate such conditions and, if the Owner who may consult with the Architect, if any, determines that they differ materially and cause an increase or decrease in the Contractor's cost or time required for,

performance of any part of the Work, will consider in good faith an equitable adjustment in the Contract Sum or Contract Time, or both. If the Owner who may consult with the Architect, if any, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Owner shall promptly notify the Contractor in writing, stating the reasons. If the Contractor disputes the Owner's determination the Contractor shall nevertheless diligently proceed with the Work subject to the Contractor's right to dispute resolution as provided herein.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in ~~progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment.~~the commencement or progress of the Work by an act or neglect of the Owner, or of an employee of either, or of a separate contractor employed by the Owner, or if and to the extent caused by the negligence of the Owner; or by changes ordered in the Work pursuant to Article 10; or by delays associated with the delivery of materials ordered by the Owner for which the Contractor is not responsible and which impact the critical path of the construction schedule; or acts of God (such as tornado, hurricane, flood, etc.), or unusual delays by relevant governmental authorities in performing inspections and/or issuing governmental approvals which are a condition precedent to the issuance of a certificate of occupancy (temporary or permanent) or failure or unusual delay by any local utility (i.e., electricity, water, sewer) providing services to the Project that impact the critical path of the construction schedule or is necessary to obtain a certificate of occupancy (temporary or permanent), then the Contract Time shall be extended by Change Order or Constructive Change Directive for such reasonable time as the Owner, who may consult with the Architect, if any, may determine and the construction schedule shall be revised accordingly. In order for the Contractor to obtain an extension of time, the Contractor must prove to the Owner that the cause of the delay will extend the critical path of the construction schedule leading to the occupancy or use of the Project. Such extensions of Contract Time shall apply only to delays for which the Contractor has no responsibility. If a delay is attributable to both the Contractor and the Owner (including parties for which each is responsible), then entitlement to an extension of Contract Time shall apply proportionately

§ 11.3 ~~Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.~~Notwithstanding anything to the contrary in the Contract Documents, an extension of Contract Time, to the extent permitted herein, shall be the sole remedy of the Contractor for any (1) delay in the start, prosecution, or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity, or (4) other similar claims, whether or not such claims are foreseeable, contemplated, or uncontemplated. In no event is the Contractor entitled to any compensation or recovery of any damages, in connection with any claim, including without limitation, consequential damages, lost opportunity costs, impact damages or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents, including without limitation, ordering changes in the Work, or directing the suspension, rescheduling or correction of the Work, regardless of the extent or frequency of the Owner's exercise of such rights or remedies, are not to be construed as active interference with the Contractor's performance of the Work.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 Contract Sum

The Contract Sum stated in this Agreement, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. If applicable, prior to the Commencement Date, the Contractor and the Owner shall agree on a schedule of values allocating the entire Contract Sum to the various portions of the Work, which shall be used as the basis for reviewing the Contractor's Applications for Payment. This schedule shall not be amended, unless agreed to by the Owner and the Contractor in writing.

§ 12.2 Applications for Payment

§ 12.2.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the ~~Architect~~ Owner, who may consult with the Architect, if any, an itemized Application for Payment for Work completed in accordance with the values or unit prices stated in this Agreement. The Application shall be supported by data substantiating the Contractor's right to payment as the Owner or ~~Architect~~ Architect, if any, may reasonably require, such as evidence of payments made to, and waivers of liens from, subcontractors and suppliers. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent

incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing.

§ 12.2.2 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, ~~to the best of the Contractor's knowledge, information, and belief,~~ be free and clear of liens, claims, security interests, or other encumbrances adverse to the Owner's interests.

§ ~~12.3 Certificates~~ **12.2.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment.
The ~~Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner in writing of the Architect's reasons for withholding certification~~ Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. Provided that the Owner shall have paid the Contractor all amounts properly due and owing under the Contract Documents, the Contractor shall defend, indemnify and hold the Owner harmless from any liens, claims, security interests or encumbrances filed by the Contractor, any Subcontractor, Sub-subcontractor or anyone claiming by, through or under them. As a condition of Payment, the Contractor shall provide a fully executed waiver with respect to all Work for which payment has been made by the Owner through the previous Application for Payment..

~~in part; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner~~ § **12.2.4** The Contractor agrees that it shall take whatever action is reasonably necessary to remove or discharge any lien, claim, security interest or encumbrance placed on the Project in favor of any Subcontractor, material supplier, or other person or entity making a claim by reason of having provided labor, materials and equipment related to the Work for which the Contractor is responsible, including without limitation, discharging by substitution of a bond. The Contractor agrees that it shall take such action within twenty (20) days of written receipt of notice and evidence of such lien, claim, security interest or encumbrance from the Owner.

§ 12.3 Certificates for Payment
~~of the Architect's reason for withholding certification in whole. If certification or notification is not made within such seven day period, the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time and the Contract Sum shall be equitably adjusted due to the delay.~~The Owner, who may consult with the Architect, if any, will, within ten days after receipt of the Contractor's Application for Payment, either approve the Application for Payment in its entirety or in part or disapprove all or part of the Contractor's Application for Payment. The Owner shall provide to the Contractor in writing the reasons for such disapproval of all or part of the Contractor's Application for Payment. The Owner, in all events, shall pay approved amounts in the Contractor's Application for Payment pursuant to the terms of this Agreement. The Owner, who may consult with the Architect, if any, may withhold payments then due or that may become due in the future for defective work or other damages caused by the Contractor.

§ 12.4 Progress Payments
§ 12.4.1 ~~After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Contract Documents.~~The Owner shall make payments to the Contractor as provided herein.

§ 12.4.2 The Contractor shall promptly pay each subcontractor and supplier, upon receipt of payment from the Owner, an amount determined in accordance with the terms of the applicable subcontracts and purchase orders.

§ 12.4.3 Neither the Owner nor the ~~Architect~~ Architect, if any, shall have responsibility for payments to a subcontractor or supplier.

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

§ 12.5 Substantial Completion

§ 12.5.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended ~~use.~~use as reasonably determined by the Owner who may consult with the Architect, if any.

§ 12.5.2 When the Contractor believes that the Work or designated portion thereof is substantially complete, it will notify the ~~Architect and the Architect~~ Owner, and Architect, if any, and the Owner, who may consult the Architect, if any, will make an inspection to determine whether the Work is substantially complete. When the ~~Architect~~ Owner, who may consult the Architect, if any, determines that the Work is substantially complete, the ~~Architect~~ Owner or Architect, if any, shall prepare a Certificate of Substantial Completion or other document addressing Substantial Completion that shall establish the date of Substantial Completion, establish the responsibilities of the Owner and Contractor, and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 12.5.3 The Owner reserves the right to take possession and occupy any portion of the Project prior to the completion of the entire Project provided that a temporary certificate of occupancy has been obtained with respect to such portion of the Project. Such completion and occupancy, however, shall not interfere with the Work.

§ 12.6 Final Completion and Final Payment

§ 12.6.1 Upon receipt of a final Application for Payment, the ~~Architect~~ Owner, who may consult the Architect, if any will inspect the Work. When the ~~Architect~~ Owner, who may consult with the Architect, if any, finds the Work acceptable and the Contract fully performed, the ~~Architect~~ Owner or Architect, if any, will promptly issue a final Certificate for ~~Payment.~~Payment or other document addressing final payment.

§ 12.6.2 Final payment shall not become due until the Contractor submits to the ~~Architect~~ Owner releases and waivers of ~~liens,~~ liens and claims, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests, or encumbrances arising out of the Contract.

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

ARTICLE 13 PROTECTION OF PERSONS AND PROPERTY

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury, or loss to employees on the Work and other persons who may be affected thereby, the Work and materials and equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, or by anyone for whose acts the Contractor may be liable.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the ~~Architect~~ Owner or Architect, if any, as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement, and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of one year after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Assignment of Contract

~~Neither party to the Contract shall assign the Contract as a whole without written consent of the other.~~ The Contractor shall not assign the Contract without the written consent of the Owner. Any such assignment shall be null and void. The Owner may, without the Contractor's prior written consent, assign its rights hereunder, provided that such assignee agrees to comply with all applicable provisions of the agreement and the Contractor is given written notice of such agreement signed by both the Owner and the assignee.

§ 15.2 Tests and Inspections

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the ~~Architect~~ Owner, who may consult with the Architect, if any, requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections, or approvals that do not become requirements until after the Contract is executed. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 15.3 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 Termination by the Contractor

If the ~~Work is stopped under Section 12.3 for a period of 14 days~~ Owner fails to make payment to the Contractor then due and owing in accordance with the terms of this Agreement for a period of 30 days past the date such payment is due and owing through no fault of the Contractor, the Contractor may, upon seven additional days' written notice to the Owner and Architect, if any, terminate the Contract and recover from the Owner payment for Work executed ~~including reasonable overhead and profit, and~~ and accepted by the Owner and the reasonable and documented costs incurred by reason of such termination. In no event shall the Contractor be entitled to anticipated overhead and profits on Work not performed.

§ 16.2 Termination by the Owner for Cause

§ 16.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 is otherwise guilty of substantial breach of a provision of the Contract Documents.

§ 16.2.2 When any of the above reasons exist, the Owner, ~~after consultation with the Architect,~~ who may consult with the Architect, if any, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may

- .1 take possession of the site and of all materials thereon owned by the Contractor, and
- .2 finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

§ 16.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work ~~executed, and~~ executed and accepted by the Owner, and reasonable and documented costs incurred by reason of such ~~termination, along with reasonable overhead and profit on the Work not executed.~~termination.. In no event shall the Contractor be entitled to anticipated overhead and profits on Work not performed.

ARTICLE 17 OTHER TERMS AND CONDITIONS

(Insert any other terms or conditions below.)

§ 17.1 Any deviation from the Contract Documents must be completely detailed in writing by the Contractor and approved in writing by the Owner prior to the performance of said Work.

§17.2 The Contractor agrees that all persons working on behalf of the Contractor shall obey the rules and regulations established by the Owner and shall obey the reasonable directions of the Owner's employees. The Contractor shall be responsible for the acts and conduct of its employees, subcontractors and agents while on the Owner's premises. The Contractor shall take all necessary measures to prevent injury and loss to persons and property located on the Owner's premises. The Contractor shall be responsible for all damages to persons or property caused by the Contractor, its employees, subcontractors and agents. The Contractor must give the Owner written assurance that no employees of the Contractor or its subcontractors have criminal records of such nature that would place at risk students and staff of the Owner, if applicable. The Owner reserves the right to approve and /or reject any personnel assigned to any phase of the Project for any reason the Owner deems appropriate in its sole discretion.

§ 17.3 If the Contract entails any exposure to a regulated material, including, but not limited to, asbestos or lead, the Contractor certifies that it and each of its subcontractors and their employees shall be certified and trained under all OSHA and other relevant regulations for such Work.

§ 17.4 State, federal or other grant programs may fund some or the entire Contract. The Contractor is advised that such funding programs may include contractual provisions binding on contractors and which may, for example, require audits or certifications under oath that the Contractor has not been debarred, suspended or excluded from any publicly funded project or programs.

§ 17.5 The Contractor is required to comply with all provisions of the Civil Rights Act of 1964, the Equal Employment Opportunity Act of 1972, Executive Orders 11246, 11375, 11478 and, if applicable, the Connecticut Fair Employment Practice Law.

Pursuant to Conn. Gen. Stat. Sect. 4a-60, the Contractor agrees and warrants that, in the performance of the Contract, the Contractor 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 it is shown by the Contractor that such disability prevents performance of the Work involved, in any manner prohibited by the laws of the United States or the State of Connecticut. The Contractor 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 it is shown by such Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Connecticut Commission on Human Rights and Opportunities' (3) the Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such Contractor has a contract or understanding, a notice to be provided by the commission advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor agrees to comply with each provision of section 4a-60 and section 46a-56, 46a-68e, and 46a-68f; (5) the Contractor 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

contractor as related to the provisions of this section and section 46a-56. The Contractor shall comply with all applicable affirmative action, equal opportunity and CHRO requirements as provided by applicable law or regulation.

§ 17.6 This Contract is subject to prevailing wages as defined by Connecticut law, section 31-53, as amended. The Contractor shall include the costs of such wages in the Contract Price. The wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in subsection (h) of this section, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day

§ 17.7 If the Contractor is a non-resident Contractor then the Contractor and Owner shall comply with all laws established by the state of Connecticut for such non-resident contractors.

§ 18.1 RESOLUTION OF CLAIMS AND DISPUTES

Unless another method of dispute resolution is agreed to by the Owner and the Contractor, all claims and disputes shall be resolved by trial in a court of competent jurisdiction. The term "Claim" is demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. It also includes other disputes and matters in question between the Owner and the Contractor arising out of or relating to the Contract. The responsibility to substantiate claims shall rest with the party making the claim.

§ 18.2 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed to in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments when due in accordance with the Contract Documents that are not the subject of a good faith dispute.

§ 18.3 NO DAMAGE FOR DELAY. In all events, the Contractor shall have no Claim for damages or costs of any kind resulting from a delay in the Work as demonstrated by the Contractor's schedule of critical path activities, regardless of whether all or part of such delay may be in any way attributable to the acts, the failure to act, or the omissions of the Owner, the Owner's agents or representatives, the Owner's consultants, if any, the Architect or the Architect's consultants, if any. The parties agree that their sole remedy for such delay shall be an extension of time, which may be granted or denied in accordance with the terms of this Agreement.

§ 18.4 WAIVER OF IMPACT CLAIMS. In all events, the Contractor waive all kinds of impact claims, including but not limited to, efficiency, loss of productivity, trade stacking, disruption, re-sequencing, and the like, regardless of whether all or part of such impact may be in any way attributable to the acts, the failure to act, or the omissions of the Owner, the Owner's agents or representatives, the Owner's consultants, if any, the Architect or the Architect's consultants, if any.

§ 18.5 The Contractor shall include similar No Damage For Delay and Waiver of Impact Claim provisions in any agreements that either party executes with any Subcontractors, suppliers and any other persons or entities that either party employs to perform the Work, and shall name the other party as third-party beneficiaries of such provisions.

§ 18.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor waives Claims for consequential damages arising out of or relating to this Contract. This waiver includes damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit.

This Agreement entered into as of the day and year first written above.
(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

OWNER *(Signature)*

Regional School District No. 18

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)
LICENSE NO.:
JURISDICTION:

STATE OF CONNECTICUT
Contractor Verification
(in accordance with Public Act 16-67)

Directions to Contractor: Connecticut law requires that any contractor applying or bidding for a contract (including individuals who are independent contractors) with a local or regional board of education, a governing council of a state or local charter school, or interdistrict magnet school operator require any employee with the contractor who would be in a position involving direct student contact to supply the contractor with the information provided in this form. Information may be collected either through a written communication or telephonically.

In addition, pursuant to Connecticut General Statutes (C.G.S.) § 10-233c, the contractor is required to contact – either telephonically or through written communication – any current or former employer of an employee if such employer was a local or regional board of education, a governing council of a state or local charter school, or interdistrict magnet school operator or if the employment caused the employee to have contact with children, to request any information concerning whether there was a finding of abuse or neglect or sexual misconduct against the employee. If the contractor receives any information indicating such a finding, or otherwise has knowledge of such a condition, the contractor must immediately forward such information to any local or regional board of education with which the contractor is under contract.

Directions to Employee of Contractor: Pursuant to Connecticut state law, employees of a contractor who would be in a position involving direct student contact must supply all of the information provided in Section 2 of this form.

Section 1 – To be completed by Contractor

Name	
Street address	
City, State, Zip Code	
Contact person	
Telephone number/email address	

Section 2 – To be completed by Employee of Contractor

Part A. On a separate sheet of paper, please list the name, address and telephone number of each current or former employer, if such current or former employer was a local or regional board of education, a governing council of a state or local charter school, or interdistrict magnet school operator, or if such employment otherwise caused you to have contact with children.

Part B. Please complete the questions below in their entirety.

Have you ever:

Y ☐ N ☐ Been the subject of an abuse or neglect or sexual misconduct investigation by any employer, state agency or municipal police department (answer "no" if the investigation resulted in a finding that all allegations were unsubstantiated)?

Y ☐ N ☐ Been disciplined or asked to resign from employment or resigned from or otherwise separated from any employment while an allegation of abuse or neglect was pending or under investigation by the Department of Children and Families (the "department"), or an allegation of sexual misconduct was pending or under investigation or due to an allegation substantiated pursuant to section 17a-101g of abuse or neglect, or of sexual misconduct or a conviction for abuse or neglect or sexual misconduct?

Y ☐ N ☐ Had a professional or occupational license or certificate suspended or revoked or ever surrendered such a license or certificate while an allegation of abuse or neglect was pending or under investigation by the department or an investigation of sexual misconduct was pending or under investigation, or due to an allegation substantiated by the department of abuse or neglect or of sexual misconduct or a conviction for abuse or neglect or sexual misconduct?

Part C – Written Consent and Disclosure Authorization. I hereby authorize the entities I have listed in Section 2 of this form to release to the entity listed in Section 1 of this form the information required to be released by my previous employer pursuant to (C.G.S.) § 10-222c along with any related records. I hereby consent to and authorize disclosure by the State Department of Education of the information requested pursuant to C.G.S. § 10-222c, as amended by Public Act 16-67, and I hereby authorize the release by the State Department of Education of any related records. I further hereby release the above-named employer(s) and the State Department of Education from any and all liability of any kind that may arise from the disclosure or release of records requested pursuant to C.G.S. § 10-222c, as amended by Public Act 16-67.

_____ _____

Signature of Applicant Date

NOTES:

The terms provided below are currently defined in state law as follows. Please note that statutes may be amended from time to time.

Sexual Misconduct means – "any verbal, nonverbal, written or electronic communication, or any other act directed toward or with a student that is designed to establish a sexual relationship with the student, including a sexual invitation, dating or soliciting a date, engaging in sexual dialog, making sexually suggestive comments, self-disclosure or physical exposure of a sexual or erotic nature and any other sexual, indecent or erotic contact with a student." Connecticut General Statutes § 10-222c(k).

Abuse or neglect means – "abuse or neglect as described in Section 46b-120, and includes any violation of Sections 53a-70, 53a-70a, 53a-71, 53a-72a, 53a-72b or 53a-73a." Connecticut General Statutes § 10-222c(k).

Prevailing Wage Requirements

- **Prevailing Wage Law Poster**
- **Section 31-53b**
- **Informational Bulletin 10-Hour OSHA**
- **Notice for all Mason Contractors**
- **Connecticut General Statute 31-55a**
- **Contracting Agency Certification Form**
- **Contractor's Wage Certification Form**
- **Payroll Certification**
- **Informational Bulletin-Occupational Classifications**
- **Footnotes**
- **Wage Rates**

Opportunity ⋆ Guidance ⋆ Support

CONNECTICUT DEPARTMENT OF LABOR

THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

If you have QUESTIONS regarding your wages
CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine
Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007,* where the total cost of all work to be performed is at least $100,000)

(1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);

(2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;

(3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least $100,000;

(4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;

(5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

(6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;

(7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;

(8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;

(9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

(10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;

(11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;

(12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;

(13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;

(14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and

(15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.

(16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTMATELY ARISE CONCERNIG THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice

To All Mason Contractors and Interested Parties Regarding Construction Pursuant to Section 31-53 of the Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

STATUTE 31-55a

- SPECIAL NOTICE -

To: All State and Political Subdivisions,Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the ***contractor's*** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.

- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

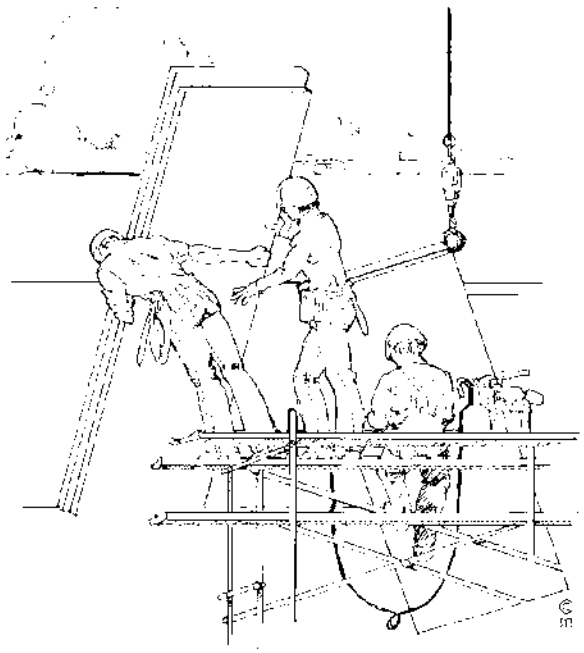
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached "Contracting Agency Certification Form" to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

✎ Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with

_____, located at _____,
project name and number address

shall be $_____, which includes all work, regardless of whether such project

consists of one or more contracts.

CONTRACTOR INFORMATION

Name:_____

Address:_____
Authorized Representative:_____
Approximate Starting Date: _____

Approximate Completion Date:_____

_____ _____
Signature Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

Construction Manager at Risk/General Contractor/Prime Contractor

I,_____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

_____
Street

_____
City

and all of its subcontractors will pay all workers on the

_____
Project Name and Number

_____
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

_____
Signed

Subscribed and sworn to before me this _____ day of _____,_____.

_____
Notary Public

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

In accordance with Connecticut General Statutes, 31-53
Certified Payrolls with a statement of compliance
shall be submitted monthly to the contracting agency.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

CONTRACTOR NAME AND ADDRESS:	SUBCONTRACTOR NAME & ADDRESS	WORKER'S COMPENSATION INSURANCE CARRIER
		POLICY #
		EFFECTIVE DATE:
		EXPIRATION DATE:

PAYROLL NUMBER	Week-Ending Date	PROJECT NAME & ADDRESS

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE S	M	T	W	TH	F	S	Total ST Hours Total O/T Hours	BASE HOURLY RATE TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				HOURS WORKED EACH DAY								$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							

12/9/2013
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER _____OF

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

1) Medical or hospital care _____ 4) Disability_____

2) Pension or retirement _____ 5) Vacation, holiday_____

3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____of _____, (hereafter known as

Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

a) The records submitted are true and accurate;

b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;

c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);

d) Each such person is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;

e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and

f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

_____ _____ _____

(Signature) (Title) Submitted on (Date)

*****THIS IS A PUBLIC DOCUMENT*****
*****DO NOT INCLUDE SOCIAL SECURITY NUMBERS*****

Weekly Payroll Certification For
Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

Week-Ending Date:
Contractor or Subcontractor Business Name:

WEEKLY PAYROLL

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE S	M	T	W	TH	F	S	Total ST Hours Total O/T Hours	BASE HOURLY RATE TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
												HOURS WORKED EACH DAY								
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							
												$ Base Rate	1. $ 2. $ 3. $							
												$ Cash Fringe	4. $ 5. $ 6. $							

*IF REQUIRED

NOTICE: THIS PAGE MUST BE ACCOMPANIED BY A COVER PAGE (FORM # WWS-CP1)

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

In accordance with Connecticut General Statutes, 31-53
Certified Payrolls with a statement of compliance
shall be submitted monthly to the contracting agency.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

CONTRACTOR NAME AND ADDRESS:
Landon Corporation, 15 Connecticut Avenue, Northford, CT 06472

SUBCONTRACTOR NAME & ADDRESS
XYZ Corporation
2 Main Street
Yantic, CT 06389

WORKER'S COMPENSATION INSURANCE CARRIER
Travelers Insurance Company
POLICY # #BAC8888928
EFFECTIVE DATE: 1/1/09
EXPIRATION DATE: 12/31/09

PAYROLL NUMBER: 1
Week-Ending Date: 9/26/09
PROJECT NAME & ADDRESS: DOT 105-296, Route 82

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION / Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE: S 20	M 21	T 22	W 23	TH 24	F 25	S 26	Total ST Hours / Total O/T Hours	BASE HOURLY RATE / TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS: FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
Robert Craft 81 Maple Street Willimantic, CT 06226		M/C	Electrical Lineman E-1 1234567 Owner OSHA 123456		8	8	8	8	8		S-TIME 40 O-TIME	$ 30.75 Base Rate $ 8.82 Cash Fringe	1. $ 5.80 2. $ 3. $ 2.01 4. $ 5. $ 6. $	$1,582.80				P-xxxx	$1,582.80	#123 $ xxx.xx
Ronald Jones 212 Elm Street Norwich, CT 06360	65%	M/B	Electrical Apprentice OSHA 234567		8	8	8	8	8		S-TIME 40 O-TIME	$ 19.99 Base Rate $ 16.63 Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $	$1,464.80	xx.xx	xxx.xx	xx.xx	G-xxx	$1,464.80	#124 $xxx.xx
Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B		M/H	Project Manager			8					S-TIME 8 O-TIME	$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $	$1,500.00	xx.xx	xx.xx	xx.xx	M-xx.x		#125 xxx.xx
											S-TIME O-TIME	$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							

HOURS WORKED EACH DAY

7/13/2009
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER 1 OF 2

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

1) Medical or hospital care Blue Cross 4) Disability _____

2) Pension or retirement _____ 5) Vacation, holiday _____

3) Life Insurance Utopia 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of 9/26/09,

I, Robert Craft of XYZ Corporation, (hereafter known as

Employer) in my capacity as Owner (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

a) The records submitted are true and accurate;

b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;

c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);

d) Each such employee of the Employer is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;

e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and

f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA–The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such employee's name first appears.

Robert Craft (Signature) owner (Title) 10/2/09 Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

Robert Craft (Signature) owner (Title) 10/2/09 Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

*****THIS IS A PUBLIC DOCUMENT*****
*****DO NOT INCLUDE SOCIAL SECURITY NUMBERS*****

Information Bulletin
Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine *"job classification"* on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- ***ASBESTOS WORKERS***

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- ***ASBESTOS INSULATOR***

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- ***BOILERMAKERS***

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- ***BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS***

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- ***CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS***

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

• The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

• If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

• An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- ***ELECTRICIANS***

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- ***ELEVATOR CONSTRUCTORS***

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. ****License required by Connecticut General Statutes: R-1,2,5,6.***

- ***FORK LIFT OPERATOR***

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- ***GLAZIERS***

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- ***IRONWORKERS***

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- ***INSULATOR***

• Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- ***LABORERS***

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- ***PAINTERS***

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- ***LEAD PAINT REMOVAL***

• Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

• Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- ***PLUMBERS AND PIPEFITTERS***

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- ***POWER EQUIPMENT OPERATORS***

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- ***ROOFERS***

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- ***SHEETMETAL WORKERS***

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- ***SPRINKLER FITTERS***

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ****License required per Connecticut General Statutes: F-1,2,3,4.***

- ***TILE MARBLE AND TERRAZZO FINISHERS***

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

• Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
• Hauling material off site is not covered provided they are not dumping it at a location outlined above.
• Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➢ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

⇨ Please Note: If the "Benefits" listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the "Benefits" section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

Project: Tennis Court Replacement Old Lyme High School

Minimum Rates and Classifications
for Heavy/Highway Construction

Connecticut Department of Labor
Wage and Workplace Standards Division

ID#: **H** 26832

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:
Project Town: Old Lyme
FAP Number:
State Number:
Project: Tennis Court Replacement Old Lyme High School

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	34.72	32.15
2) Carpenters, Piledrivermen	33.53	25.66
2a) Diver Tenders	33.53	25.66

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3) Divers	41.99	25.66
03a) Millwrights	34.04	26.09
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	51.00	21.80
4a) Painters: Brush and Roller	34.62	21.80
4b) Painters: Spray Only	36.62	21.80
4c) Painters: Steel Only	35.62	21.80
4d) Painters: Blast and Spray	37.62	21.80

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4e) Painters: Tanks, Tower and Swing	36.62	21.80
5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	38.50	28.61+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	43.62	32.06
----LABORERS---- -		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	30.75	20.84
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.00	20.84

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10) Group 3: Pipelayers	31.25	20.84
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	31.25	20.84
12) Group 5: Toxic waste removal (non-mechanical systems)	32.75	20.84
13) Group 6: Blasters	32.50	20.84
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	31.75	20.84
Group 8: Traffic control signalmen	18.00	20.84
Group 9: Hydraulic Drills	29.30	18.90

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----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.98	20.84 + a
13b) Brakemen, Trackmen	32.01	20.84 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	32.01	20.84 + a
15) Form Erectors	32.34	20.84 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

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16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.01	20.84 + a
17) Laborers Topside, Cage Tenders, Bellman	31.90	20.84 + a
18) Miners	32.98	20.84 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.47	20.84 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.27	20.84 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.29	20.84 + a

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21) Mucking Machine Operator	40.06	20.84 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	29.51	24.52 + a
Three axle trucks; two axle ready mix	29.62	24.52 + a
Three axle ready mix	29.67	24.52 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	29.72	24.52 + a
Four axle ready-mix	29.77	24.52 + a

Heavy duty trailer (40 tons and over)	29.98	24.52 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.77	24.52 + a
----POWER EQUIPMENT 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. & Over, Tunnel Boring Machines. (Trade License Required)	40.97	24.80 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	40.64	24.80 + a
Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; 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)	39.88	24.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	39.48	24.80 + a

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Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	38.87	24.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	38.87	24.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	38.55	24.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel).	38.20	24.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	37.79	24.80 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	37.34	24.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	35.24	24.80 + a

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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	35.24	24.80 + a
Group 12: Wellpoint Operator.	35.18	24.80 + a
Group 13: Compressor Battery Operator.	34.58	24.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	33.41	24.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a

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Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	34.26	24.80 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.50	6.5% + 9.00

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23a) Truck Driver	40.96	6.5% + 17.76
----LINE CONSTRUCTION----		
24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.10	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

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01) 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 5 and 7**

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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.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

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.

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.

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Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

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GENERAL REQUIREMENTS

SECTION 01 1401

PRESERVATION AND RESTORATION OF SITE FEATURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Protection restoration of existing improvements.

2. Restoration of existing improvements.

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 IDENTIFICATION OF EXISTING FEATURES

A. Prior to commencing construction activities, Contractor shall identify and delineate those areas or specific improvements that are not to be disturbed. Areas or specific improvements within the Limits of Work/Contract Limits and general work areas which are not to be disturbed shall be clearly marked or fenced. Monuments and markers shall be protected before construction operations commence. Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting designated areas, specific improvements, monuments, and markers at the Project Site.

B. Prior to commencing construction activities, Contractor shall conduct a "walk-down" of the Project Site with Engineer and/or Owner. The purpose of such "walk-down" is to document pre-construction conditions of items/areas of concern.

1. Contractor shall make note of any damage visible on items/areas of concern, with reference to specific location.

2. Owner must be present for "walk-down" to be considered valid.

3.2 PROTECTION OF EXISTING FEATURES

A. General

1. All areas or specific improvements, including but not limited to vegetation, utilities, poles, wires, fences, curbings, property-line markers, and other structures, which must be preserved in place without being temporarily or permanently relocated shall be carefully supported and otherwise protected from damage by Contractor.

2. As excavation approaches underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools.

B. Pavements

1. On paved surfaces to remain, Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment, or store tools, equipment or materials which may cut or otherwise damage such surfaces.

2. All surfaces, which have been damaged by Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of construction operations. Such restoration shall meet the approval of Engineer.

C. Utilities

1. Safeguard and protect from damage any utility to remain in service. Before excavating near any utility, notify the utility owner, coordinate protective work, and comply with the utility owners' requirements.

2. All utility services shall be supported by suitable means so that the services shall not fail when tamping and settling occurs.

3. Where known utilities are encountered, notify Engineer and document location and type of utility before proceeding with work in such area.

4. When uncharted or incorrectly charted utilities are encountered, stop work and notify Engineer. Cooperate with the utility owners in maintaining their utilities in operation prior to resuming work.

D. Retaining Structures: Provide bracing, shoring, sheeting, sheet piling, underpinning or other retaining structures necessary to guard against any movement or settlement of existing or new construction, utility systems, paving, or other improvements. Contractor assumes responsibility for the strength and adequacy of retaining structures, and for the safety and support of construction, utilities or paving, and for any movement, settlement or damage thereto.

3.3 REPLACEMENT

A. In case of damage, Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. When the Owner does not wish to make the repairs themselves, all damage shall be repaired by Contractor, or, if not promptly done by him, Engineer may have the repairs made at the expense of Contractor.

B. Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged through the prosecution of work at no expense to Owner. All repair and replacement work shall match the existing in-kind. Final acceptance of said work shall be at the sole judgement of Owner.

3.4 RELOCATION

A. If certain existing structures are encountered that in the opinion of Engineer require temporary or permanent relocation or removal, Engineer may order in writing that Contractor undertake all or part of such work or to assist the Owner in performing such work. For such occurrences, Contractor shall be compensated as applicable, as extra work.

1. In removing existing structures, Contractor shall use care to avoid damage to the material, and Engineer shall include for payment only those new materials, which, in his judgment, are necessary to replace those unavoidably damaged.

B. The structures to which the provisions of the preceding two paragraphs shall apply include structures which (1) are not indicated on the drawings or otherwise provided for, (2) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (3) in the opinion of Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced. (See Item 3.19, "Sub-Surface Obstructions" also). Contractor shall protect items/areas of concern:

3.5 LAND RESOURCES

A. Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subarticles.

B. Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Contractor shall restore any such landscape features damaged or destroyed during construction operations.

1. Trees which are to remain are shown on the Drawings. Unless specifically authorized by Engineer, no construction equipment or materials shall be placed or used within the drip line of trees shown on the drawings to be saved/to remain. No excavation or fill shall be permitted within the drip line of trees to be saved/to remain except as approved by Engineer.

2. No ropes, cables, or guys shall be fastened to or attached to any tree(s) for anchorage unless specifically authorized by Engineer. Where such special use is permitted, Contractor shall provide effective protection to prevent damage to the tree.

3.6 WIND PROTECTION

A. Should high wind warnings be issued by the U.S. Weather Bureau, Contractor shall take every precaution to minimize danger to persons, to the work, and to adjacent properties.

3.7 TREE PROTECTION FENCING

A. Install fencing completely around all trees to be protected within the project area as shown on the Drawings or as directed by Engineer. Install fencing before any construction activities commence and maintain in place until final grading and seeding is complete and accepted.

B. Contractor shall not place, or stockpile, any construction or excavation materials within the drip line of any trees. Vehicle and construction equipment shall not be parked, nor left running (idling), within the drip line of any tree.

C. Any excavation within the drip line of trees to be protected shall be performed by hand, unless otherwise directed by Engineer.

D. Where construction equipment must pass within the drip line of trees to remain, Contractor shall install wooden tree protection on the trunk of the tree, as detailed, and as directed by Engineer.

E. Where excavation requires the cutting of tree roots, roots shall be cut with sharp cutting tools and reburied as soon as possible. Until roots can be reburied, the exposed roots are to be covered with wet burlap to prevent roots from drying out. The burlap is to be kept wet until the roots can be reburied.

F. Where cutting of tree root system has occurred, Contractor shall water the tree root system to the extent of the tree canopy with at least ½ inch of water within 72 hours of when the damage occurred.

G. When less than ½ inch of water has fallen during a 7-day period, Contractor shall water the tree root system to the extent of the tree canopy with at least ½ inch of water.

H. Trees damaged by construction activities are to be repaired within 72 hours using current arboricultural standards. Those trees determined by Engineer to be damaged beyond repair shall be removed and replaced by Contractor at no additional cost to Owner.

END OF SECTION

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 BASIS OF PAYMENT

A. Payments to the Contractor shall be based upon the bid prices provided by Contractor on the Bid Sheet. All payments will be made to Contractor in accordance with the terms and conditions of the Contract between Contractor and Owner.

B. For lump sum payment items, progress payments to the Contractor shall be based upon the percentage complete of the lump sum tasks. The estimate shall be based on the approximate quantity of Work completed in accordance with the Contract Plans and Specifications. Estimates of the percentage of lump sum items complete shall be submitted with the Application for Payment. If appropriate, the Owner may request backup documentation to support partial payment of lump sum items. Such documentation may include vendor invoices or personnel timesheets.

C. The Contractor shall accept payment as full compensation for furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the Work and for performing all Work contemplated and embraced by the Contract and the Bid Documents.

1.2 APPLICATION FOR PAYMENT

A. Contractor shall submit Applications for Payment at a frequency of no greater than once per month. Applications for payment shall state the period covered and contain a listing of the Work items for which payment is being requested, percentages complete for lump sum items or quantities completed for unit price items, and a summary of billings to date (by Work item) and payments made. Applications for payment shall be reviewed by the Engineer and approved by the Owner.

B. On the 25th of each month submit an itemized Application of Payment to Owner, with all required supporting documents, covering the Work completed as of the date of the Application for Payment.

C. Form of Submittal: Submit Schedule of Values on AIA Document G702, Application and Certificate for Payment or computer-generated form of the same style acceptable to Engineer.

D. Submit a progress schedule update with each Application for Payment.

E. When Owner requires substantiating data, Contractor shall submit suitable information with cover letter identifying Application of Payment number and date, line item by number and description.

F. Progress Payments

1. Progress payments shall be made to Contractor in accordance with the terms of the Contract between the Contractor and the Owner.

2. Progress payments will be based upon progress estimates by Contractor and verified by Engineer of the actual physical progress of the work, utilizing the Schedule of Values approved by Engineer.

1.3 INCIDENTAL WORK

A. Incidental work shall be defined as all work not otherwise specified but obviously necessary for the proper completion of the work as specified and shown the Drawings.

B. The Contractor shall be responsible for all incidental work items. The Owner may eliminate any items of Work, or portions of Work from the contract as deemed to be in the Owner's interest. Such action shall in no way invalidate the Contract. No payment shall be made to the Contractor for anticipated profits from Work that is eliminated from the contract by the Owner.

C. Incidental work items for which payment is not measured or made include, but are not limited to:

1. Protection in-place all existing utilities and structures;

2. Implementation of standard health and safety requirements specific to each Work task (e.g., personal protective equipment, support equipment, monitoring personnel, etc.);

3. Clean up; and

4. Cooperation with other Contractors.

1.4 RETAINAGE

A. The Owner shall retain payments valued at ten (10) percent of the total project cost until the requirements of Section 01 7700 – Project Close-Out have been met to the satisfaction of the Engineer and Owner.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2010

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Definition and description of measurement and payment criteria for Bid Items to be used for the work.

2. Definition and description of measurement and payment criteria for Alternate Bid Items to be used for the work.

B. Refer to the Bid Form for the preparation of bid pricing in conjunction with this Section.

1.2 MEASUREMENT OF QUANTITIES

A. Lump Sum Items

1. No quantities will be measured. The work is to be completed as a complete functional system as shown on the Drawings and as called for in the Specifications. Refer to individual Bid Items.

B. Unit Price Items

1. There are no unit price items in the contract.

C. Allowances

1. There are no allowances in the contract.

1.3 PAY ITEMS

A. Lump Sum Items

1. Payment for lump sum Work shall be made in accordance with the accepted Schedule of Values.

2. An unbalanced or front-end loaded Schedule of Values will not be acceptable.

3. Payment for lump sum Work covers all Work required to complete the work as shown or specified and shall be based on the breakdown included in the approved Schedule of Values.

4. Alternates

a. If selected by Owner, Add Alternates will be in addition to the Base Bid.

b. If selected by Owner, Deduct Alternates will be subtracted from the Base Bid.

B. Unit Price Items

1. There are no unit price items in the contract.

C. Allowances

1. There are no allowances in the contract.

1.4 BASE BID ITEMS

A. Bid Item 1 – Tennis Court Construction

1. Description: Contractor shall perform all work as shown on the Drawings and called for in the Specifications to include the following:

Mobilization, Site Preparation, and Close-out: Mobilize all necessary personnel, tools and equipment; prepare the Project Site as shown on the Drawings, as called for in the Specifications, and as required to complete the work in a safe and controlled manner; establish and maintain temporary facilities or work practices as shown on the Drawings, as called for in the Specifications, and as required to complete the work including, but not necessarily limited to, administrative facilities, fencing, barriers, warning signs, erosion and sedimentation controls and related facilities. At the conclusion of the work, restore and stabilize affected areas and fully demobilize all temporary facilities, equipment, and materials; complete close-out as shown on the Drawings and as called-for in the Specifications.

Site Demolition: Demolish and completely remove those improvements and appurtenances as called-for in the Specifications, shown on the Drawings, or as otherwise clearly required to completed the Work. Provide for the off-site removal and legal disposal of all demolition waste.

Site Grading: Provide all required clearing, material import/export, earthwork, grading, filling, compaction, and testing, of earth materials to the lines and grades depicted on the Drawings and as called-for in the Specifications.

Construction of Tennis Courts and Associated Improvements: Provide for the installation of new post-tensioned court facilities, pavements, walks, slabs/pads, fencing, signs, pavement markings, loam and seed, restoration, and other site improvements as depicted on the Drawings and as called-for in the Specifications.

Incidental work: Contractor shall include in his price for this Bid Item all incidental work items required to complete the work as shown on the Drawings and as called for in the Specifications. Incidental work shall be defined as all work not otherwise specified but obviously necessary for the proper completion of the work, including, but not necessarily limited to, permitting, fees, meetings, performance-based design, submittals, construction layout, measurements, testing, inspections, general project coordination, health and safety, and project documentation.

a. Measurement – This item will be measured for payment on a Lump Sum basis.

b. Payment – The Lump Sum payment under this item will be considered full compensation, including Contractor's overhead and profit, for all labor, equipment, materials, supplies, supervision and other fees required for the work. Payment for this

lump sum item will be made based on the percentage of work completed, as determined by Engineer.

1.5 ALTERNATE BID ITEMS

A. Alternate 1 – Concrete Bleacher Pads

1. Description: Provide for the installation of two (2) concrete bleacher pads as shown on the Drawings and called for in the Specifications.

a. Measurement – The Alternate is an "Add" Alternate. This Alternate item, if selected by Owner, will be measured for payment on a Lump Sum basis.

b. Payment –Payment under this Alternate item, if selected by Owner, will be considered full compensation, including Contractor's overhead and profit, for all layout, labor, equipment, materials, supplies, supervision and other fees required for the work. Payment for this lump sum Alternate item will be made based on the percentage of work completed, as determined by Engineer.

B. Alternate 2 – Portable Bleachers

1. Description: Provide for the procurement, delivery, assembly and installation of two (2) 3 row, ADA compliant aluminum bleachers as shown on the Drawings and called for in the Specifications.

a. Measurement – The Alternate is an "Add" Alternate. This Alternate item, if selected by Owner, will be measured for payment on a Lump Sum basis.

b. Payment –Payment under this Alternate item, if selected by Owner, will be considered full compensation, including Contractor's overhead and profit, for all layout, labor, equipment, materials, supplies, supervision and other fees required for the work. Payment for this lump sum Alternate item will be made based on the percentage of work completed, as determined by Engineer.

C. Alternate 3 – Wind Screen with Logo

1. Description: Provide for the procurement and installation of new wind screens for the locations as shown on the Drawings and as called for in the Specifications.

a. Measurement – The Alternate is an "Add" Alternate. This Alternate item, if selected by Owner, will be measured for payment on a Lump Sum basis.

b. Payment –Payment under this Alternate item, if selected by Owner, will be considered full compensation, including Contractor's overhead and profit, for all layout, labor, equipment, materials, supplies, supervision and other fees required for the work. Payment for this lump sum Alternate item will be made based on the percentage of work completed, as determined by Engineer.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 2973

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Preparation and submittal of a Schedule of Values.

2. Updating Schedule of Values.

1.2 DEFINITIONS

A. The Schedule of Values is an itemized list that establishes the value of each part of the Work for a stipulated price contract and for major lump sum items in a unit price contract. The Schedule of Values is used as the basis for preparing applications for payments. Quantities and unit prices may be included in the schedule when designated by Engineer.

1.3 SCHEDULE OF VALUES SUBMITTAL

A. Submit a Schedule of Values to Engineer within ten (10) days of executing an Agreement with Owner. Upon Engineer's request, Contractor will provide supportive data substantiating their correctness. Use Schedule of Values only as basis for Contractor's Application for Payment.

B. Form of Submittal: Submit Schedule of Values on AIA Document G703, or computer generated form of the same style, using Table of Contents of these Specifications as basis for format for listing costs of work for all Divisions.

C. Identify each line item with number and title as listed in Table of Contents in these Specifications. Each line item shall be identified with number and title of the specification section, value, and quantities (if requested).

1. Itemize separate line item cost for each of the following general cost items: Performance and Payment Bonds (if applicable), field supervision and layout, temporary facilities and controls.

2. Line items including Subcontract work shall be subdivided so as to indicate value of such work.

3. For each line item which has installed value of more than $10,000, break down costs to list major products for operations under each item, rounding figures to nearest dollar.

D. Make sum of total costs of all items listed in Schedule equal to total Contract Sum.

1.4 REVIEW AND RESUBMITTAL

A. After Engineer's review and approval, the Schedule of Values shall be reviewed and approved by the bonding company (if applicable). A letter of approval from the bonding company (if applicable) approving the Schedule of Values shall accompany the final submittal of the Schedule of Values to Engineer.

B. Payment based on the Schedule of Values shall not be until all approvals are obtained. If requested, revise and resubmit Schedule of Values until approvals are obtained.

1.5 MODIFICATIONS

A. During progress of the Work, the Schedule of Values as approved by Owner shall be modified to reflect changes in the Contract Sum due to Change Orders or other modifications of the Contract. Such updated Schedule of Values shall be used for Applications for Payment.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 3100

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. General coordination procedures.

2. Coordination drawings.

3. Requests for Information (RFIs).

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 SUBMITTALS

A. Contractor Personnel

1. Prior to the start of construction, submit a list of key Contractor personnel, including site superintendent, project manager, and other key personnel on the project team and/or at the Project Site. Include the following information in tabular form:

a. Individuals' name and their duties and responsibilities

b. Field office and/or home office mailing address

c. Office or field office telephone number(s),

d. Cellular telephone number

e. E-mail address. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

B. Subcontractor List

1. Prepare a written summary identifying individuals or firms proposed for each portion of the work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

a. Name, address, and telephone number of entity performing subcontract or supplying products.

b. Number and title of related Specification Section(s) covered by subcontract.

c. Drawing number and detail references, as appropriate, covered by subcontract.

C. Post copies of lists in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.3 GENERAL COORDINATION PROCEDURES

A. Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract and for safety, as well as conformity and timeliness of all portions of the Work.

B. Contractor's Superintendent

1. Contractor shall employ and assign a competent Superintendent whose qualifications shall be acceptable to Owner. Superintendent shall serve on a full-time basis at the Project Site and shall be authorized to act on behalf of Contractor in all matters related to the Work.

2. The same person shall continue in the capacity of Superintendent until the Work has been completed, the Superintendent ceases to be employed by Contractor, or the Superintendent becomes sick or disabled. If at any time the Superintendent is not satisfactory to Owner, Contractor shall, if requested by Owner, replace the Superintendent with another satisfactory to Owner.

3. The Superintendent or his designated representative must be present at the Project Site at all times when on-site Work is performed.

C. Coordinate work included in different Specification Sections and/or on different Drawings to ensure efficient and orderly installation of each component of the work, to ensure coordination of those project elements that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the work depends on completion or installation of other parts of the work.

2. Coordinate completion of work and/or installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

D. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

E. Contractor shall ensure that each Subcontractor shall coordinate its construction operations with those of other Subcontractors and entities to ensure efficient and orderly installation of each part of the work. Contractor and each Subcontractor shall coordinate their respective operations with other operations included in different Specification Sections and/or Drawings that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

F. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their work is required.

G. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.

2. Preparation of the schedule of values.

3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.

5. Progress meetings.

6. Pre-installation conferences.

7. Project closeout activities.

8. Startup and adjustment of systems.

H. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.

b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the

information and resolution of conflicts between installed components before submitting for review.

c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.

e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.

f. Indicate required installation sequences.

g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

1.5 REQUESTS FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.

2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.

2. Project number.

3. Date.

4. Name of Contractor.

5. Name of Engineer.

6. RFI number, numbered sequentially.

7. RFI subject.

8. Specification Section number and title and related paragraphs, as appropriate.

9. Drawing number and detail references, as appropriate.

10. Field dimensions and conditions, as appropriate.

11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.

12. Contractor's signature.

13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: If not provided by Engineer, utilize a Contractor-provided form that meets Engineer's approval.

D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven (7) working days for Engineer's response for each RFI.

1. The following Contractor-generated RFIs will be returned without action:

a. Requests for approval of submittals.

b. Requests for approval of substitutions.

c. Requests for approval of Contractor's means and methods.

d. Requests for coordination information already indicated in the Contract Documents.

e. Requests for adjustments in the Contract Time or the Contract Sum.

f. Requests for interpretation of Engineer's actions on submittals.

g. Incomplete RFIs or inaccurately prepared RFIs.

2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.

3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to the Agreement and/or applicable Division 1 Specifications.

4. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer and Owner in writing within 5 working days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log to Engineer weekly. At a minimum, include the following:

1. Project name.

2. Name and address of Contractor.

3. Name and address of Engineer.

4. RFI number including RFIs that were returned without action or withdrawn.

5. RFI description.

6. Date the RFI was submitted.

7. Date Engineer's response was received.

F. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within five (5) working days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 3120

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Quality assurance and control of installation.

2. References.

3. Field samples.

4. Inspection and testing laboratory services.

5. Manufacturers' field services and reports.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

D. Sampling and testing services are Contractor's responsibility for this project. All Quality Assurance and Quality Control shall be the responsibility of Contractor via Testing Agency and Testing Laboratory as applicable. Contractor shall retain and pay for the services of such Testing Agency/Testing Laboratory to perform all testing in accordance with applicable standards.

1.2 REFERENCES

A. Reference to any technical society, organization, group or regulation are made in accordance with applicable designation and unless otherwise noted or specified, all work shall conform to the latest edition as applicable.

B. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Laboratory: An entity engaged to perform specific laboratory tests.

H. Testing Agency: An entity engaged to collect samples, perform specific in-field tests, and/or inspections. The Testing Laboratory may provide the services of the Testing Agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

J. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

K. Experienced: When used with an entity or individual, “experienced” means having successfully completed the minimum number and type of projects indicated in individual Specification Sections, or in the absence of such specified minimum number and type, a minimum of ten (10) years in the execution of projects that are similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of all authorities having jurisdiction.

1.4 SUBMITTALS

A. Qualification Data: For Contractor’s quality-control personnel.

B. Contractor’s Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work.

C. Testing Agency Qualifications: For testing agencies specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.

2. Entity responsible for performing tests and inspections.

3. Description of test and inspection.

4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

B. Permits, Licenses, and Certificates: For Owner’s records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. Contractor Responsibilities: Quality-Assurance services are Contractor’s responsibility for this project. Contractor shall retain the services of a third-party Testing Agency and Testing

Laboratory to perform sampling and testing as required. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility.

B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship, to produce Work of specified quality.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

E. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

F. Testing Laboratory and Testing Agency Qualifications: An independent agency with the experience and capability to conduct inspection, sampling, testing, and analysis required, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. Preconstruction Testing: Where Testing Agency or Testing Laboratory is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

    a. Provide test specimens representative of proposed products and construction.

    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.

    d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

2. Testing Agency /Testing Laboratory Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Owner. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

H. Pre-Construction Submittals:

1. Concrete

    a. Design Data: Submit Mix Design data for each class of Ready-Mix Concrete at least 15 calendar days prior to start of specified work.

2. Earthwork

   a. Site Characterization of Off-Site Borrow Sources: The following information shall be submitted to Engineer for review at least two weeks prior to use of an off-site borrow source:

      1) Location and name of the borrow source site.

      2) Owner and contact information for the borrow source site.

      3) Present and past usage of the source site and materials.

      4) Any previously existing report(s) associated with an assessment of the source site as relates to the presence of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.

      5) Location within the site from which the material will be obtained.

   b. Chemical Testing Data: For each type/classification of earth material proposed and each source of earth material proposed: Submit a letter signed by an authorized representative of material supplier stating that such proposed material is free of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.

   c. Samples: 50-pound sample of each type of off-site bedding, fill, aggregates, and backfill that are proposed for use at the Project Site in an air-tight container for the testing laboratory, a minimum of two weeks prior to delivery of such material to the site. Use of these proposed materials by Contractor prior to testing and approval or rejection shall be at Contractor's risk.

   d. Material Testing Data

      1) Gradation analysis for each type of borrow and on-site fill materials by ASTM D422.

      2) Soil classification (ASTM D2487) and Moisture-Dry Density Curve (Proctor Test-Modified) by ASTM D1557 for all proposed fill and backfill materials at a frequency of one (1) test per every 50 cubic yards of material type. One test minimum for materials less than 50 cubic yards.

3. Other: Submit product data for all materials or products proposed for use on the project. Submit manufacturer’s product data, descriptive data, and/or other documentation required to demonstrate proposed materials or products conform with the requirements of the Contract Documents.

1.7 QUALITY CONTROL

A. Contractor Responsibilities: Quality-control services are Contractor’s responsibility for this project. Contractor shall retain the services of a third-party Testing Agency and Testing Laboratory to perform sampling, testing, monitoring, or inspection as required. Tests and inspections not explicitly assigned to Owner are Contractor’s responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify Testing Agency at least 24 hours in advance of time when Work that requires sampling, testing, monitoring, or inspecting will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Re-testing/Re-inspecting: Provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm as required and/or on instructions by Engineer. Payment for retesting will be charged to Contractor by deducting inspection or testing charges from the Contract Sum/Price.

C. Testing by Owner, Discretionary Testing: Engineer reserves the right to perform any material testing or in-field testing on the project, reserves the right to determine the suitability of all materials to be used for in the work, and to reject any material or completed construction that is not in conformance with applicable Specifications or standards.

D. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.

E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

F. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

G. Test Requirements: Concrete

1. Tests will be required to determine whether the concrete being produced complies with the standard of quality and strength as specified.

2. Additional Tests: Additional testing of in-place concrete shall be conducted when test results indicate that specified concrete strengths and other characteristics have not been attained. Additional testing shall consist of cored cylinders to determine adequacy of concrete or other non-destructive testing methods that may be approved by Engineer. Contractor shall pay for all such additional testing. Any holes made shall be patched by the Contractor at their expense.

3. Testing Standards

a. Sampling: ASTM C172. Collect samples of fresh concrete to perform tests specified.

b. Concrete aggregate materials proposed for use in the work shall be sampled and tested in accordance with ASTM C33.

c. Portland Cement shall be sampled and tested in accordance with ASTM C150.

d. Slump Tests: ASTM C143. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded.

1) Frequency: Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete unless otherwise specified or called-for.

e. Air Content: ASTM C231 (primary method) or ASTM C173 (secondary method).

1) Frequency: Test air-entrained concrete for air content at the same frequency as specified for slump tests.

f. Temperature Tests: ASTM C1064.

1) Frequency: Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete,

unless otherwise specified or called-for, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

g. Compressive Strength Tests: ASTM C39. Make five test cylinders for each set of tests in accordance with ASTM C31. Take precautions to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve.

1) Frequency: Samples for strength tests of each mix design (class) of concrete placed each day shall be taken not less than once a day, nor less than once for each 50 cubic yards of concrete, nor less than once for each 1,000 square feet of surface area for slabs (including walks and sidewalks) or walls.

H. Test Requirements: Earthwork

1. Compaction Testing: Perform compaction testing (i.e. ASTM D2922 and ASTM D3017 or ASTM D1556) at the frequency indicated below.

a. Trench: 1 test per lift, every 500 square-feet or 200 feet of trench.

b. Embankment, fill, base, or bedding: 1 test per lift, every 1,000 square feet.

c. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.

2. If testing indicates that compacted subgrade, backfill, or fill are below specified density, additional compaction and/or replacement of material shall be provided at no expense to Owner until required compaction is achieved.

3. Compaction Density: Compaction density shall be expressed as a percentage of maximum dry density at optimum moisture content according to ASTM D 1557 Method C. Density indicated is minimum required.

a. Under structures, pavements, slabs, and sidewalks: 95 %

b. Utilities, below pipe centerline: 95%

c. Utilities below unpaved surface, above pipe centerline: 92%

d. Utilities below paved surface, above pipe centerline: 95%

e. Embankments: 92%

f. Landscaped areas: 90 %.

I. Submittals

1. Concrete

a. Delivery Tickets: Provide delivery tickets with each load of concrete delivered to the Project Site. Delivery tickets shall provide the following information:

1) Project name printed on ticket.

2) Name of producer, identification of plant.

3) Date and time of day.

4) Type of material.

5) Cubic yards of material loaded into truck.

6) Project number, purchase order number, name of Contractor (if Contractor other than producer).

7) Truck number for specific identification of truck.

8) Individual aggregate, cement, water weights (masses) and any admixtures shall be printed on plant tickets.

9) Water/cement ratio.

10) Additional water allowance in gallons based on water/cement ratio for mix.

b. Test Repots: Submit test reports for all concrete testing.

2. Earthwork

a. Compaction test results keyed to date and specific location of testing.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.

2. Description of the Work tested or inspected.

3. Date test or inspection results were transmitted to Engineer.

4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 3216

CONSTRUCTION SCHEDULE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Preparation of a Construction Schedule.

2. Updates/revisions to the Construction Schedule throughout the duration of the Work.

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

1.2 DEFINITIONS

A. Activity: The smallest amount of Work or a single type of Work completed in one specific area of the project defined in the Construction Schedule. Non-Work Activities are included in a schedule when they significantly constrain production activities.

B. Baseline Schedule: A schedule that has been agreed upon by all parties to be the basis upon which to calculate time and earnings progress. The originally-approved Construction Schedule is the first baseline schedule. New baselines will be established following agreements of cost and time as included in construction contract modifications.

C. Construction Schedule: A method of planning and scheduling the Work of the project utilizing a horizontal bar chart format with a separate bar for each Activity with appropriate date/timing data that is an effective tool for planning and monitoring the progress of the Work.

D. Critical Path: That set of activities from the start of the Work through to the end of the Work, that have the minimum Total Float. This Total Float is a shared property of all activities on the Critical Path.

E. Free Float: The amount of time that a schedule activity can be delayed without delaying the early start date of any immediately following schedule activities.

F. Milestone: A key event, deliverable, and/or date that will have the greatest impact on the schedule.

G. Slippage: The time a project or project activity is late compared to the initial Baseline Schedule as the variation between the planned dates of a project starting and finishing or a project activity starting and finishing.

H. Total Float: The total amount of time that a schedule activity may be delayed from its early start without delaying the project finish date, or violating a schedule constraint.

1.3 CONSTRUCTION SCHEDULE FORMAT

A. Format: Utilize a horizontal bar chart (Gantt format) with a separate bar for each Activity with appropriate date/timing data. Clearly label each Activity and corresponding date/timing data.

B. Scale and Spacing: Provide space for notations and revisions.

C. Sheet Size: Minimum sheet size 11 inches by 17 inches. Provide both print and electronic (Portable Document Format; .pdf) versions of the Construction Schedule.

D. Sequence of Listings: The chronological order of the start of each Activity.

1.4 CONSTRUCTION SCHEDULE CONTENT

A. Show complete sequence of construction by Activity, with dates of project start and project completion and dates of start and completion of each Activity. The Critical Path with Baseline must be indicated.

B. Depict Milestones associated with each Activity.

C. Show accumulated percentages of completion of each Activity, and total percentage of Work completed, as of the first day of each month.

1.5 SUBMITTALS

A. Construction Schedule.

1. Submit an initial Construction Schedule within 5 days after date of Notice of Award. After review, resubmit revised Construction Schedule, as required, within 3 days.

2. Submit revised/updated Construction Schedule to Owner and Engineer weekly.

3. Submit one (1) revised/updated Construction Schedule with each Application for Payment.

4. Provide sufficient paper copies of updated Construction Schedule for all attendees at periodic construction meetings, and other project meetings as required. Provide additional copies for periodic distribution as required.

1.6 QUALITY ASSURANCE

A. Utilize skilled personnel with experience in construction scheduling and reporting techniques.

1.7 REVISIONS

A. Indicate progress of each Activity and projected completion date of each Activity.

B. Identify Activities modified since previous schedule, major changes in scope, Slippage, and other identifiable changes.

C. Provide narrative report to define problem areas, anticipated delays, and impact on schedule.

D. Report corrective action taken, or proposed, and its effect.

1.8 DISTRIBUTION

A. Distribute copies of the Construction Schedule to Owner, Engineer Subcontractors, suppliers, and other concerned parties as appropriate.

B. Instruct recipients to promptly report, in writing, problem anticipated by projections indicated in schedules.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements and procedures for preparing and transmitting data to Engineer.

2. Various submittals are specified under applicable Specification Sections.

B. Unless otherwise stipulated herein, all submittals requiring review for conformance with the design documents shall be transmitted by mail to the following address:

BSC Group
300 Winding Brook Drive
Glastonbury, CT 06033
Phone: 860-652-8227
Attention: Jesse Harris, PLA

or by or electronic mail to the following address:

jharris@bscgroup.com

1.2 DEFINITIONS

A. Conforms: The term “Conforms,” when applied by the Engineer to the Contractor’s submittals, drawings or documents, shall mean the submittals, drawings or documents are satisfactory from the standpoint that the Engineer has not observed any statement or feature that appears to deviate from the Specifications requirements. The Contractor shall retain the entire responsibility for complete conformance with all of the Specification’s requirements.

B. Conforms As Noted: The term “Conforms As Noted” when applied by the Engineer to the Contractor’s submittals, drawings or documents, shall mean the submittals, drawings or documents conform as defined above, except that the changes shown are necessary to be in conformance with the Specification’s requirements. On the basis that the Contractor shall retain the entire responsibility for compliance with all of the Specification’s requirements, the Contractor shall either:

1. Incorporate the changes into its work, drawings or documents if the change does not affect the Contractor’s responsibility under warranty.

2. Inform the Engineer that the changes cannot be made without prejudice to the Contractor’s responsibility under the warranty and resubmit with explanations of the reasons therefore.

C. Does Not Conform or Revise and Resubmit: The terms “Does Not Conform” or “Revise and Resubmit” when applied by Engineer to Contractor’s submittals, drawings or documents, shall mean the submittals, drawings or documents are not satisfactory from the standpoint that the

Engineer has observed statements or features that appear to deviate from the Specifications requirements.

1.3 CONTRACTOR RESPONSIBILITIES

A. Prepare submittals and review for accuracy prior to submission, and respond to Engineer's action.

B. Determine and verify:

1. Field measurements;

2. Field construction criteria; and

3. Conformance to Specifications.

C. Coordinate each submittal with requirements of Work and of Contract Documents.

D. Notify Engineer in writing, at time of submission, of any deviations in submittals from requirements of drawings, Specifications and Contract Documents.

1.4 SUBMITTAL PROCEDURES

A. Coordinate preparation and processing of submittals with performance of construction activities. Unless a specific submittal time-frame is specified in the related specification Section, transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with phases of the Work that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. At a minimum, submittals shall be provided to Owner and Engineer in duplicate. Additional requirements for the number of submittals are contained in the specific Specification Sections.

4. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.

a. Allow five (5) working days for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.

b. Any submittals which may require review and/or approval by an outside Agency (City, Town, utility, etc.) shall be allocated a minimum of twenty (20) working days. The Owner shall not be held responsible for any delay associated with the approval or rejection of any substitution or other revisions proposed by the Contractor.

c. If an intermediate submittal is necessary, process the same as the initial submittal.

d. Allow five (5) working days for reprocessing each submittal.

e. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label, cover page or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label, cover page or title block.

1. Provide a space approximately 4″ x 5″ on the label, cover page or beside the title block to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken:

a. Submittal name, number and topic.

b. Date of submission.

c. Name and address of Contractor.

d. Number and title of appropriate Specification Section annotated in accordance with this Section.

e. Drawing number and detail references, as appropriate.

f. Identification of revisions on re-submittals.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than Contractor will be returned without action.

1. All submittals shall be sent with an official transmittal.

2. With each submittal, provide the Specification Section or sheet number the item submitted is found under and a descriptive generic name based on its content.

3. Number each transmittal consecutively starting with 001. If requested by Engineer, match the submittal numbering indicated on the Submittal Schedule or Submittal Log.

4. All submittals shall be numbered conforming to the following example, with each component separated by a dash (-):

Submittal Numbering Format

A	B	C	D
001	01 5713	Silt Fence	New
002	31 2310	Granular Fill	New
002A	31 2310	Granular Fill	Resubmitted
002B	31 2310	Granular Fill	Additional Information

a. The chronological identification number assigned to the submittal package.

b. The Specification Section or sheet number the item submitted is found under.

c. Keyword(s) from the descriptive generic submittal name.

d. The status of the submittal.

Example

001-01 5713-Silt Fence-New

5. When re-submitting a rejected submittal or additional information, identify submittal with the original submittal number followed by a letter, starting with "A" and continuing for each subsequent re-submittal, to designate the additional submission(s).

6. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

7. Distribution: Following response to the initial submittal, Contractor shall print and distribute copies to the Subcontractors and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

8. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.5 SUBMITTAL SCHEDULE

A. Engineer will prepare a schedule of submittals for the project and provide an initial copy of same to Contractor.

B. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.

C. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted and verify that each item, and the submittal for it, conforms in all respects with the requirements of the Contract Documents. By affixing his signature to each submittal, Contractor is certifying that this coordination has been performed.

D. Coordinate the schedule with all necessary subcontractors to ensure their understanding of the importance of adhering to the approved schedule and their ability to so adhere. Coordinate as required to ensure the grouping of submittals as appropriate.

E. Distribution: Following response to initial submittal schedule, print and distribute copies to the Engineer, Subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

F. Tracking: Provide Engineer, at the beginning of each month, a list of all submittals over the previous month. Include the date each submittal was sent to Engineer, the content of each transmittal and the disposition of the submittal.

1.6 ENGINEER'S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. No Exceptions Taken or Conforms: The term "No Exceptions Taken" or "Conforms," when applied by the Engineer to the Contractor's submittals, drawings or documents, shall mean the submittals, drawings or documents are satisfactory from the standpoint that the Engineer has not observed any statement or feature that appears to deviate from the Contract Specifications, Drawings, or other applicable Contract Documents. That part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Specifications, Drawings, or other applicable Contract Documents; final acceptance will depend upon that compliance. Contractor shall retain the entire responsibility for complete conformance with such Contract Specifications, Drawings, or other applicable Contract Documents.

2. Conforms As Noted or Furnish as Corrected: The term "Conforms as Noted" or "Furnish as Corrected" when applied by the Engineer to the Contractor's submittals, drawings or documents, shall mean the submittals, drawings or documents conform as defined above, except that the changes shown are necessary to be in conformance with the Contract Specifications, Drawings, or other applicable Contract Documents. That part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Specifications, Drawings, or other applicable Contract Documents; final acceptance will depend on that compliance. On the basis that, Contractor shall retain the entire responsibility for compliance with all of the Specification's requirements, the Contractor shall either:

a. Incorporate the changes into its work, drawings or documents if the change does not affect the Contractor's responsibility under warranty.

b. Inform the Engineer that the changes cannot be made without prejudice to the Contractor's responsibility under the warranty and resubmit with explanations of the reasons therefore.

3. Does Not Conform or Revise and Resubmit: The terms "Does Not Conform" or "Revise and Resubmit" when applied by Engineer to Contractor's submittals, drawings or documents, shall mean the submittals, drawings or documents are not satisfactory from the standpoint that the Engineer has observed statements or features that appear to deviate from

the Contract Specifications, Drawings, or other applicable Contract Documents. Contractor shall not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. In response to this stamp, Contract shall either:

a. Revise the submittal to conform with the Contract Specifications, Drawings, or other applicable Contract Documents and re-submit.

b. Update the submittal with additional information as required and re-submit.

c. Prepare a new submittal in accordance with notations and/or the requirements of the Contract Specifications, Drawings, or other applicable Contract Documents and re-submit.

4. Rejected: The term "Rejected," when applied by Engineer to Contractor's submittals, drawings or documents, shall mean the submittals, drawings or documents are not satisfactory from the standpoint that the Engineer has observed statements or features that appear to deviate from the Contract Specifications, Drawings, or other applicable Contract Documents. Contractor shall not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Submittals that are rejected shall be revised as required to conform with the Contract Specifications, Drawings, or other applicable Contract Documents.

   a. Do not permit submittals marked "Rejected" to be used at the Project site, or elsewhere where Work is in progress.

5. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will not be returned unless specifically requested and will be marked "Action Not Required" on Contractor's record of submittal. Submittals which are prepared but are not required will not be processed.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 5713

TEMPORARY EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Installation of temporary erosion and sedimentation control measures
2. Maintenance of temporary erosion and sedimentation control measures.
3. Monitoring of site condition and installation of supplemental temporary erosion and sedimentation control measures.
4. Sediment removal and disposal
5. Temporary seeding or other surface stabilization measures.
6. Removal of temporary erosion and sedimentation control measures.
7. Monitoring, documentation, and recordkeeping.
8. Installation of permanent erosion control materials.
9. Final cleanup.

B. Erosion and sediment control techniques include, but are in no way limited to, silt fence, hay bales, drainage structure inserts/filters, mulching with hay/straw, netting/matting, grassing, stone dikes/berms/check-dams, compost blankets and berms, barriers, diversions, traps, basins, and appurtenances which will ensure that erosion and sediment pollution will be either eliminated or maintained within acceptable limits.

C. The measures specified herein are the minimum requirements which Contractor shall comply to control erosion and siltation throughout execution of the work. Contractor shall provide additional work if necessary to control erosion and siltation throughout the duration of the construction as conditions dictate, or as directed by Engineer.

D. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

E. Contractor is responsible for all health and safety.

1.2 SUBMITTALS

A. Submit material specifications and shop drawings for all materials furnished under this Section.

B. Prior to the start of the construction, submit schedule for the construction of required stormwater detention basins, temporary and permanent erosion and sedimentation control measures, clearing and grubbing, grading, structures at watercourses, construction, and paving.

C. During construction, submit to Engineer schedule changes that affect timing of construction.

D. Submit copies of all inspection and maintenance report forms.

1.3 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Regulations of Connecticut State Agencies (RCSA)

1. 22a-315-10 through 19, Soil and Water Conservation

C. Connecticut Department of Energy and Environmental Protection (DEEP)

1. Connecticut Guidelines for Soil Erosion and Sediment Control, DEEP Bulletin 34, State of Connecticut Council on Soil and Water Conservation, 2002.

D. State of Connecticut Department of Transportation (ConnDOT)

1. Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016 and any supplements.

1.4 PERMIT CONDITIONS

A. Contractor and Subcontractors are bound to comply with any project-related permits obtained by Owner or Engineer for the work of the project. Such permits will affect performance of the work, and Contractor and Subcontractors are bound to comply with requirements of such permit and representations contained in permit application as though Contractor and Subcontrator were the Permittee/permit-holder. Requirements and conditions set forth in Owner or Engineer-obtained project-related permits and permit applications shall be binding on Contractor just as any Specification would be.

1.5 QUALITY CONTROL

A. Contractor shall be responsible for the timely installation and maintenance of all sedimentation control devices necessary to prevent the erosion of soil or movement of sediment from construction activities to off-site areas via surface runoff or underground drainage systems. Measures in addition to those shown on the Drawings necessary to prevent the movement of sediment off site shall be installed, maintained, removed, and cleaned up at the expense of Contractor.

B. Where additional erosion and sedimentation control measures are required beyond what is indicated on the Drawings or herein, comply with applicable sections of the Connecticut Guidelines for Soil Erosion and Sediment Control, DEEP Bulletin 34, State of Connecticut Council on Soil and Water Conservation, 2002.

C. Engineer has the authority to order immediate, additional, temporary control measures to prevent contamination of adjacent streams or other watercourses, or other areas of water impoundment and damage by erosion.

D. If Engineer observes construction procedures and operations that jeopardize erosion control provisions, Engineer will notify Contractor. If such construction procedures and operations are not corrected promptly, Engineer may suspend the performance of any or all construction until

corrections have been made, and such suspension shall not be the basis of any claim by Contractor for additional compensation, nor for an extension of time to complete the Work.

E. Should construction materials be washed away or otherwise rendered ineffective in the opinion of Engineer during the progression of the Work, Contractor shall replace the installations at no additional cost to the Owner.

1.6 COORDINATION WITH PERMANENT EROSION CONTROL PROVISIONS

A. Coordinate temporary erosion and sedimentation control measures with permanent erosion control features to the extent practical to ensure economical, effective and continuous erosion control throughout construction and post-construction periods.

PART 2 PRODUCTS

2.1 HAY BALES

A. Hay bales shall be made of cut hay with forty (40) pounds minimum weight and 120 pounds maximum weight. Bales shall be free of rotten or degraded hay, significant splits or voids. Hay bales shall be held together with a minimum of two bands made of either wire or heavy twine.

B. Stakes to anchor the bales shall be a minimum of 36 inches long and made of hardwood with a minimum dimension of 1½-inch by 1½-inch normal size. Metal stakes may be used instead of wooden stakes. Metal stakes shall be round, “U,” “T,” “L,” or “C” shaped with a minimum weight of 0.5 pounds per foot.

C. Replace individual hay bales upon loss of 30% of original mass or volume, whichever is less.

2.2 SILT FENCE

A. Woven Polypropylene geotextile having a minimum weight of 3.1 ounces per square yard conforming to the following:

1. Mechanical and Physical Properties of Silt Fence Geotextile

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value
Weight	ASTM D 3776	oz/yd^2	5
Grab Tensile Strength	ASTM D 4632	Pounds; machine direction (MD) and cross machine direction (CD)	125 - 125
Grab Elongation (Max percent)	ASTM D 4632	Percent (%); machine direction (MD) and cross machine direction (CD)	20–20
Trapezoidal Tear	ASTM D 4533	Pounds; machine direction (MD) and cross machine direction (CD)	30 - 30
Permittivity	ASTM D 4491	Sec^{-1}	0.15
Flow Rate	ASTM D 4491	gal/min/ft2	15–20
Apparent Opening Size	ASTM D 4751	(U.S. Sieve)	30–35
UV Resistance (500 hurs)	ASTM D 4355	% strength retained	70

B. Silt fence shall be constructed of a minimum thirty-six (36) inch wide continuous woven geotextile. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics. Edges of the fabric shall be finished to prevent the outer

fibers from pulling away from the geotextile. Geotextile shall be free of defects or flaws that significantly affect its physical and/or filtering properties.

C. Fabric shall be securely fastened to stakes a minimum of 42 inches long and made of hardwood with a minimum dimension of 1½ inch by 1½ inch normal size such that a 6 to 8 inch length of fabric is unattached at the bottom for anchorage in soil. Metal stakes may be used instead of wooden stakes. Metal stakes shall be round, "U," "T," "L," or "C" shaped with a minimum weight of 0.5 pounds per foot. Stakes shall be spaced not greater than ten feet apart. When required, wire or another type of support shall be constructed between the geotextile fabric and the posts to improve the load carrying capacity of the silt fence.

2.3 CATCH BASIN INSERT

A. Manufactured "bag type" catch basin insert of woven polypropylene geotextile with integral lifting loops or straps conforming to the following:

1. Mechanical and Physical Properties of Catch Basin Insert

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value
Grab Tensile Strength	ASTM D 4632	Pounds	350
Grab Elongation (Max percent)	ASTM D 4632	Percent (%)	30
Trapezoidal Tear	ASTM D 4533	Pounds	120
Puncture	ASTM D 4833	Pounds	140
Mullen Burst	ASTM D 3786	psi	600
Permittivity	ASTM D 4491	gal/min/sq ft	0.3
Flow Rate	ASTM D 4491	gal/min/ft2	150
Apparent Opening Size	ASTM D 4751	(U.S. Sieve)	40
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	90

Note: Catch basin inserts for catch basins with curb openings shall be equipped with integral curb deflector.

2.4 STRAW MULCH

A. Straw mulch shall be comprised of threshold straw of oats, wheat, barely, or rye that is free from noxious weeds, mold or other objectionable material. Straw mulch shall contain at least 50 percent by weight of material to be 10-in or longer. Straw shall be in an air-dry condition and suitable for placement with blower equipment. Straw mulch shall be utilized on all newly graded areas with slopes exceeding 5% to protect areas against washouts and erosion unless other erosion control measures are provided.

PART 3 EXECUTION

3.1 GENERAL

A. Install erosion and sedimentation control measures as shown on the Drawings prior to any site disturbance.

B. No work shall be started until erosion control schedules and installation have been accepted by Engineer.

C. Engineer has the authority to control the surface area of each material exposed by construction operations and to direct Contractor to immediately provide permanent or temporary pollution control measures to prevent contamination of adjacent watercourses or other areas of water impoundment. Every effort shall be made by Contractor to prevent erosion on the site and abutting properties or areas.

D. Contractor shall construct all permanent erosion and sediment control features at the earliest practical time as outlined in the accepted schedule. Temporary erosion and sediment control measures shall be used to correct conditions that develop during construction, which were unforeseen, but are needed prior to installation of permanent control features, or that are needed temporarily to control erosion or sedimentation which develops during construction operations.

E. Contractor shall limit as necessary the surface area of the earth material exposed to sufficiently maintain and protect the slopes to prevent pollution. Where erosion is likely to be a problem, clearing and grubbing operations shall be scheduled and performed so that grading operations and permanent erosion and sediment control features can follow immediately thereafter, if conditions permit; otherwise, temporary control measures will be required between successive construction stages.

F. Erosion control measures shall be maintained by Contractor, and he shall remove such installations only upon completion of the work and the site is stabilized or when authorized to do so by Engineer.

G. Contractor shall operate all equipment and perform all construction operations so as to minimize pollution. Contractor shall cease any of his operations, which will increase pollution during rainstorms.

H. Failure by Contractor to control erosion, pollution, and siltation shall be cause for the Engineer to employ outside assistance to provide the necessary corrective measures. The cost of such assistance, including engineering costs, will be charged to Contractor and appropriate deductions made to Contractor’s payment.

3.2 HAY BALES

A. Hay bales shall be positioned as indicated on the Drawings and/or as necessary to prevent off site movement of sediment produced by, or as a result of, construction activities, or as direct by the Engineer.

B. Hay bales shall be utilized on all catch basins and drainage facilities on the Project Site to prevent the entry of sediments or other debris. Maintain such protection throughout execution of the work until such drainage facilities have been abandoned/removed.

C. Bales shall be placed lengthwise with ends of adjacent bales tightly abutting one another to form a continuous barrier. Bales shall be entrenched to a depth of 4 inches and backfilled, with the backfill placed toward the potential source of runoff and sediment. All bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms. Each bale shall be anchored with a minimum of two stakes, driving the first stake in each bale towards the previously laid bale to drive the bales together. Stakes must be driven a minimum of 18 inches into the ground. Loose hay shall be inserted between bales as required to prevent water from escaping between the bales.

3.3 GEOTEXTILE SILT FENCE

A. Install a filter fabric silt fence prior to construction and remove after full surface restoration has been achieved. Install silt fence as indicated on the Drawings and/or as necessary to prevent off site movement of sediment produced by, or as a result of, construction activities.

B. Install as follows:

1. Hand shovel excavate a small trench a minimum of six inches wide by six inches deep on the upslope side of the desired fence line location.

2. Unroll the siltation fence system, position the post in the back of the trench (downhill side), and hammer the post at least 12 inches into the original ground.

3. Fabric rolls shall be spliced at posts. The fabric shall be overlapped six inches, folded over and securely fastened to posts.

4. Lay the bottom 6 inches of the fabric into the trench to prevent undermining by storm water run-off.

5. Backfill the trench and compact. Compaction is necessary to prevent the run-off from eroding the backfill.

6. For slope and swale installations, extend the ends of the trench sufficiently up slope such that the bottom end of the fence will be higher than the top of the lowest portion of the fence.

3.4 CATCH BASIN INLET SEDIMENT CONTROL

A. Install catch basin inlet sediment control devices in each exiting catch basin as long as it remains in use in accordance with manufacturer’s guidelines at the locations shown on the Drawings.

B. A catch basin sediment filter shall be installed and changed/cleaned per the manufacturer’s recommendations, or as directed by engineer during construction.

C. New catch basins shall have a filter installed immediately upon completion of construction. In addition, a hay bale, or similar, barrier shall be installed around the new basin and maintained in place until binder is placed or disturbed areas draining to it are stabilized.

D. Catch basins with curb openings shall have filter fabric covering the opening and the edges of the fabric shall be secured. A filter boom shall also be placed over the opening.

3.5 TEMPORARY MULCHING

A. Apply temporary mulch to areas where rough grading has been completed but final grading is not anticipated to begin within 30 calendar days of the completion of rough grading or where final grading has been completed but seeding is not anticipated for 20 days.

1. Straw/Hay Mulch

Exposure Period: 6 months

Application Method: By hand or machine

Application Rate: 110 lbs/1,000 square feet.

2. Bark Chips/Shredded Bark

Exposure Period: Less than one year

Application Method: By hand or machine

Application Rate: 6 cubic yards /1,000 square feet.

3.6 INSPECTIONS AND MAINTENANCE

A. Contractor is responsible to maintain the sediment and erosion control features at all times throughout the project duration and until the completion certification and approval has been issued.

B. Regular erosion and sediment control system inspections shall be conducted by Contractor throughout the project duration. At a minimum, Contractor shall conduct daily inspections and maintain erosion control systems in good operating condition. Report the results of the inspection and the recommended maintenance and/or repair requirements to Engineer.

C. Additional inspections may be required and/or directed prior to, or immediately following, a rain event. Repairs shall be made as necessary.

D. In the event that the sedimentation and erosion control measures employed by Contractor prove to be inadequate as determined by the Engineer, Contractor shall adjust operations to the extent necessary to prevent erosion and sediment transport.

E. Surface water shall be pumped to maintain excavations free of water. Comply with applicable requirements of the Connecticut Department of Environmental Protection, specifically those requirements related to the management of stormwater and dewatering wastewaters associated with construction activities.

F. Hay bales and/or silt fences.

1. Remove accumulated sediment once it builds up to one-half of the height of the bale or fabric.

2. Replace damaged or degraded bales as necessary or when directed by the Engineer.

3. Replace damaged fabric, or patch with a 2-ft minimum overlap. Overlaps may only be made at fence posts.

4. Make other repairs as necessary to ensure that the bales/fence is filtering all runoff.

G. Erosion Control Mats shall be inspected at least once a week. Areas where the mat has become dislodged from the soil surface or become torn shall be re-graded and re-seeded as necessary and the mat re-installed. When repetitive failures occur at the same location review conditions and modify erosion control measures to reduce failure rate. Temporary erosion control blanket damaged during the progress of work or resulting from the Contractor's vehicles, equipment, or operations shall be repaired or replaced at the expense of the Contractor.

H. Clean catch basin inlet sediment control devices in accordance with manufacturer's guidelines.

I. Any catch basins that collect sediment as a result of Contractor's work shall be thoroughly cleaned out by Contractor.

END OF SECTION

SECTION 01 5714

TEMPORARY DUST CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnishing and spreading water, calcium chloride, and/or mulch on the subgrade, or in other areas of a Project Site or associated off-site areas, for the purpose of controlling dust emissions.

B. The requirements set forth in this section of the specifications apply to all phases and areas of construction.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Regulations of Connecticut State Agencies (RCSA)

1. RCSA Section 22a-174-1 through 43, Abatement of Air Pollution.

C. ASTM International (ASTM)

1. ASTM D98, Standard Specification for Calcium Chloride.

PART 2 PRODUCTS

2.1 MATERIALS

A. Only water, calcium chloride, and mulch are approved for dust control. No asphalt or petroleum-based products may be utilized for dust control.

B. Water used shall be clean, non-polluted water obtained from sources approved by Engineer.

C. Calcium chloride, ASTM D98. Calcium chloride in pellet form and flake form shall be acceptable.

1. Calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.

2. Engineer may reject calcium chloride failing to meet the requirements of the aforementioned specifications or which has become caked or sticky in shipment.

D. Mulch

1. Straw mulch: Threshold straw of oats, wheat, barely, or rye that is free from noxious weeds, mold or other objectionable material. Straw mulch shall contain at least 50 percent by weight of material to be 10-in or longer.

2. Wood chips: Processed tree trimmings free of trash or other physical contaminants such as metal and plastic.

PART 3 EXECUTION

3.1 GENERAL

A. Dust control shall be the responsibility of Contractor and dust control operations shall meet the requirements of the State of Connecticut Department of Environmental Protection.

B. Construction sequencing shall be organized and conducted in a manner to leave existing pavement or ground coverings in place until just prior to earth excavation for the purpose of minimizing the migration of dust beyond the Project Limits into the surrounding area.

C. Engineer reserves the right to conduct active dust monitoring using visual methods and may utilize particulate measurement equipment during the course of the work. If the amount of fugitive dust and/or particulate generated during the work is deemed unacceptable in the Engineer's judgment or exceeds baseline Project Site conditions at Engineer's monitoring locations, Engineer may require Contractor to stop work and implement corrective measures. No claim for delay will be considered for work stoppage based upon the results of Engineer's active dust monitoring results.

D. Stockpiled materials from which particle have the potential of becoming airborne shall be securely covered with a temporary waterproof covering made of polyethylene, polypropylene, hypalon, or approved equal. The covers must be in place at all times when work with the stockpiles is not occurring.

E. Subcontractor shall sweep all adjacent roads and neighboring parking lots and driveways that are impacted by the work. Whenever dirt is tracked from the site it shall be cleaned as necessary to prevent it from becoming a nuisance or hazard. At a minimum, adjacent streets shall be swept once per week.

3.2 WATER

A. The application of water shall be under the control of Engineer at all times. It shall be applied only at the locations, and at such times, and in the amount as may be directed by Engineer. Quantities of water wasted or applied without authorization will not be paid for.

B. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding or pollution.

C. Contractor shall have available and maintain in an operable condition at all times, sufficient equipment for the purpose of applying water for dust control.

D. Watering equipment shall consist of pipelines, tanks, tank trucks, distributors, pumps, meters, hose or other devices, approved by Engineer, which are capable of applying a uniform spread

of water over the surface. A suitable device for a positive shut-off and for regulating the flow of water shall be located so as to permit positive operator control.

E. Applications of water for dust suppression include, but are not necessarily limited to, the following:

1. Demolition activities, material handling, material processing, and loading.

2. Earthwork.

3. Open excavation faces and dust-prone areas of the work.

4. Temporary access roads and roadway surfaces within and around the Project Site.

3.3 CALCIUM CHLORIDE

A. Calcium chloride shall be applied only at the locations, at such times and in the amount as may be directed by the Engineer and only in areas that will not be adversely affected by the application. Refer to Section 01 3543 – Environmental Protection.

B. Calcium chloride shall be uniformly applied at the rate of one and one-half (1½) pounds per square yard (lb/yd2) or at any other rate as directed by Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be to Engineer's satisfaction.

3.4 MULCH FOR DUST CONTROL

A. Coordinate the use of mulch for dust control with erosion and sedimentation control measures.

B. Straw mulch shall be applied at a rate of 100 pounds per 1,000 square feet (100 lb/1,000 ft2).

C. Wood chips or wood mulch shall be applied at such a rate as to form a layer one (1) inch thick.

3.5 OTHER DUST CONTROL MEASURES

A. A temporary seed mixture may be spread in lieu of, or in addition to mulch over areas where the suspension of grading work in disturbed areas is expected to be more than 30 calendar days and as directed by Engineer.

END OF SECTION

SECTION 01 7113

MOBILIZATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. requirements for general preparation of the Project Site as required for construction operations including:

1. General Mobilization

2. Construction Site Safety

3. Temporary Utilities

4. Security.

B. The requirements set forth in this section of the specifications apply to all phases and areas of construction.

C. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

D. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work, including all costs, fees and taxes required or levied. Notify and obtain such permits or approvals from all agencies having jurisdiction prior to starting work.

E. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. American National Standards Institute (ANSI)

1. ANSI Z535.1 – American National Standard, Safety Colors.

C. Code of Federal Regulations (CFR)

1. 29 CFR 1926, Safety and Health Regulations for Construction.

D. Connecticut State Building Code, including all applicable Amendments and Supplements.

1. 2003 International Building Code (IBC), Chapter 33 – Safeguards During Construction.

E. State of Connecticut Department of Transportation (ConnDOT)

1. Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016 and any supplements.

1.3 SAFETY REQUIREMENTS

A. As a specialist in its field of work, Contractor accepts complete responsibility for performing its work safely. This includes sole responsibility for the health and safety of its employees, agents, subcontractors (and their employees) and any other person on or adjacent to the work area. Contractor's responsibility includes compliance with all current laws, codes, ordinances, rules, regulations, standards and requirements of applicable public and private agencies and authorities ("Laws"). Contractor must take all measures and safeguards necessary to protect: (1) employees, (whether or not working for the Contractor), (2) employees and agents of Owner, (3) members of the general public and (4) public and private property.

B. Contractor is an independent contractor, with responsibility for its means and methods and the safety of its workers and Owner is not intended to be and shall not be considered an employer of Contractor's employees. As such, it shall be Contractor's sole duty to monitor the performance and practices of its employees and subcontractors for safety, to ensure that the practices and methods of performing the work are safe and to immediately stop any unsafe practices by its employees or its second or subsequent tier subcontractors ("subcontractors") or their employees. No actions taken by Owner or its consultants to monitor practices or performance of the work for safety or to stop any unsafe practices by Contractor or its subcontractors shall be construed to suggest or imply that Owner or its consultants has or has assumed any obligation or duty to take such actions.

C. Contractor accepts complete responsibility for compliance with safety procedures and policies contained in the Contract Documents and compliance with all applicable Laws, relating to health or safety, including, but not limited to the Occupational Safety and Health Act of 1970, as amended, and the regulations and standards of the Occupational Safety & Health Administration and similar state agencies ("OSHA") ("Health and Safety Laws").

D. All obligations and requirements of Contractor in this document also apply to Contractor's subcontractors. No person or entity performing work for or on behalf of Contractor is excluded from compliance.

1.4 UTILITY MARK-OUT

A. Prior to commencing work, comply with utility mark-out requirements of the Call-Before-You-Dig System (1-800-922-4455).

B. Verify the location of all subsurface utilities marked through the Call-Before-You-Dig System.

C. Not all subsurface facilities or structures will be identified through the Call-Before-You-Dig System. Confirm the location of other subsurface utilities and other subsurface facilities or structures prior to commencing work.

1.5 TEMPORARY UTILITIES

A. Temporary Water

1. All water for construction purposes, as well as the means of having the water conveyed about the work, shall be provided by Contractor and the cost of this work shall be included in the cost of the work to be done under this Contract.

2. The source, quality and quantity of water furnished shall at all times be satisfactory to Engineer.

3. Contractor shall coordinate with Regional School District 18 for temporary water service. Obtain all permits and comply with applicable codes of jurisdictional authorities.

4. Contractor shall pay Regional School District 18 (or other water provider as applicable) all fees for the provision of temporary water service and usage, including but not necessarily limited to those levied for applications, inspections, meters, valves, backflow prevention, other devices, and usage.

5. Comply with Regional School District 18 (or other water provider as applicable) requirements for temporary water service, including equipment which may be required such as meters, valves, backflow prevention or other devices.

B. Temporary Drinking Water

1. Provide adequate potable drinking water, so piped, transported, and stored so as to keep it safe and fresh, and served from satisfactory types of sanitary drinking stands, fountains, or single service containers.

2. Provide all such facilities and services in strict accordance with applicable health regulations.

C. Temporary Electric Power

1. Contractor shall coordinate with Regional School District 18 for temporary electric service to operate temporary facilities, construction equipment, temporary lighting, weather protection, heating, etc. Obtain all permits and comply with applicable codes of jurisdictional authorities and OSHA.

2. Contractor shall pay Regional School District 18 for provision of temporary power facilities and usage.

3. The use of alternate sources of temporary electric power such as generators shall be utilized only with the approval of Engineer.

D. Temporary Sanitary Facilities

1. Provide and maintain portable facilities and enclosures at the site as required to support the work of this project, and include cleaning, installation and removal to meet all OSHA requirements.

E. Other Temporary Services

1. Provide all other temporary services as required to satisfactorily complete the work.

1.6 TEMPORARY FIELD OFFICES

A. A temporary field office is not a requirement of the project.

B. If Contractor elects to utilize a temporary field office Contractor shall pay all costs for maintenance of temporary field office throughout the work.

C. Owner assumes no responsibility for security, theft, vandalism, or loss of any kind associated with Contractor’s temporary field office.

1.7 SECURITY

A. Security of work areas must be maintained by Contractor at all times during the work. Contractor shall provide for all security as necessary to control access to the Project Site and protection of Contractor's material and equipment.

B. Owner and Engineer assume no responsibility for equipment, tools or materials stored, staged or otherwise present at the Project Site. Contractor assumes full and complete responsibility for damage, theft or other loss occurring to equipment, tools or materials stored, staged or otherwise present at the Project Site.

PART 2 PRODUCTS

2.1 CONSTRUCTION SAFETY SIGNS

A. Provide Construction Safety Signs as required around the Project Site to provide warning of potential dangers or hazards associated with construction activities. Conform with 29 CFR 1926 and other State or local requirements.

B. Construction Safety Signs shall include the following:

1. Danger Signs: Danger signs shall be used only where an immediate hazard exists.

C. Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.

1. Caution Signs: Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices.

2. Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording.

3. Standard color of the background: yellow; panel, black with yellow letters. Any letters used against the yellow background shall be black. Colors: opaque glossy samples, ANSI Z535.1.

D. Exit Signs: Exit signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters shall be at least three-fourths inch in width.

E. Safety Instruction Signs: Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

F. Directional Signs: Directional signs, other than automotive traffic signs specified in "Traffic Signs" below, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background. Where applicable, directional signs shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD).

G. Traffic Signs: Construction areas shall be posted with legible traffic signs at points of hazard. All traffic control signs or devices used for protection of construction workers shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD).

2.2 TEMPORARY SIGN MOUNTING

A. Fence Mounted: Heavy duty nylon cable ties, stainless steel wire, or other approved method.

B. Post-mounted: Unless otherwise approved, ConnDOT "Breakaway Type II Installation." Posts shall be steel, 3 pounds/foot Type A or B.

C. Mounting height: 7 ft. Horizontal clearance: Locate post such that no portion of sign is within 2 feett of roadway/travelway edge.

2.3 FENCING

A. Chain Link Fence

1. Fence Height: 6 feet.

2. Mesh Size: 2 inches.

3. Mesh Gage: 12

4. Driven posts or panelized/modular units. Two stabilizers per panel

B. Temporary Plastic Barrier Fence

1. High-density polyethylene mesh, ultraviolet-stabilized.

2. Minimum height: 4.0 feet.

3. Color: high-visibility orange or green.

4. Posts: Rigid metal, channel or tube.

5. Ties: Steel wire, #14 gauge or nylon cable ties.

PART 3 EXECUTION

3.1 GENERAL MOBILIZATION

A. Sedimentation and Erosion Control

1. Install sedimentation and erosion controls in accordance with Section 01 5713 – Temporary Erosion and Sedimentation Controls.

B. Construction Entrance

1. Locate stabilized construction entrance(s) (anti-tracking pad) if shown on the Drawings. If no stabilized construction entrance is noted, ensure facilities are otherwise in-place to prevent the tracking of dirt or sediment from work areas.

C. The stabilized construction entrance shall be installed prior to any site work which involving heavy equipment or any site disturbance which may reasonably be expected to generate soils, mud, or other accumulations which may adhere to vehicles leaving the Project Site.

D. Remove stabilized construction entrance at the completion of the work.

3.2 FENCING AND BARRIERS

A. Temporary Construction Fencing

1. Install temporary construction fencing as shown on the Drawings or as required to prevent unauthorized access to work areas.

2. Contractor is solely responsible for securing the entire Project Site or area of the Work as necessary for proper control of operations on the Project Site and as required to complete the work in a safe and secure manner whether such fencing is shown on the Drawings or not.

B. Other Barriers and Similar Facilities

1. Provide other safety barriers, including but not limited to, fencing, barricades, and signage as required to prevent unauthorized entry to the Project Site, construction areas or open excavations. Provide barriers which are necessary for proper control of operations on the Project Site and as required to complete the work in a safe and secure manner. Comply at all times with applicable federal, state and local regulations. Adapt barriers and associated protection to evolving site conditions throughout the progress of the work.

C. Other Safety Devices and Work Controls

1. Provide other safety devices, including but not limited to, signs, cones, barrels, lights, warning lights, and sirens as required for safety. Provide those safety devices which are necessary for proper control of operations on the Project Site and as required to complete the work in a safe and secure manner. Comply at all times with applicable federal, state and local regulations. Adapt safety devices to evolving site conditions throughout the progress of the work.

END OF SECTION

SECTION 01 7124

AS-BUILT SURVEY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Final Survey of completed construction.

2. Preparation of “As-Built” Drawings.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. State of Connecticut, Regulations of Connecticut State Agencies (RCSA)

1. Sections 20-300b-1 through 20-300b-20, Standards for Surveys and Maps in the State of Connecticut.

1.3 SUBMITTALS

A. Surveyor: Submit name and qualifications of Professional Land Surveyor who will be responsible for the work of this Section.

B. Certificates: Submit a certificate signed by a Connecticut-licensed Land Surveyor certifying that the location and elevation of improvements comply with the Contract Documents and any approved changes in the work.

C. Final Survey: Prepare and submit two (2) copies of the final survey.

D. Project Record Documents: Submit other pertinent documentation as may be required or appropriate.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Surveyor: Engage a Land Surveyor licensed as a Professional Land Surveyor (PLS) in the State of Connecticut to perform survey work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 FINAL SURVEY

A. Provide Improvement Location Survey (As-Built Survey) to depict the horizontal and vertical location of all new construction. Survey shall contain sufficient horizontal and vertical detail to determine conformance with the Contract Documents and all other applicable codes and standards.

B. Where applicable for dimensions, elevations, and slopes, Improvement Location Survey shall demonstrate compliance with handicapped accessibility requirements.

3.2 AS-BUILT DRAWINGS

A. Prepare final As-Built Drawings which accurately depict the final configuration of all new construction. Document by means of appropriate details and notes, and all changes from the Drawings or Specifications which were made in the work or additional information which was uncovered in the course of construction.

B. As-Built Drawings shall depict the actual location of all above-grade and below grade construction. Collect sufficient survey data in an ongoing manner to accurately represent the project scope and area.

1. Survey shall include locations of all physical features installed during the construction with appropriate labelling. Subsurface construction shall depict the actual location, depth, and configuration of improvements. Utilities shall include the appropriate notations/labeling for type, size, material of construction and depth. Clearly indicate all appurtenances such as valves, tees, cleanouts, etc. with accurate location data.

2. From established survey control, conduct a topographic survey of the project area after construction is complete. Generate one-foot contours throughout the area of work and show breaks in slope and other notable features.

3. Pedestrian routes shall depict sufficient topographic data to confirm compliance with handicapped accessibility requirements.

a. Accessible Routes: A minimum of three (3) elevations across the Accessible Route (perpendicular to travel) at each edge and centerline (cross-section: edge, center, edge), spaced at a maximum distance of ten (10) feet along the Accessible Route.

b. Ramps: Elevation shall be depicted with a minimum of three (3) elevations at the bottom of the sloped segment (edge/center/edge), three (3) elevations at the top of the sloped segment(edge/center/edge), and one (1) elevation at the center of the sloped segment (center). Elevation of landings associated with a ramp shall be depicted with a minimum of four (4) elevations at each corner and one (1) elevation at the center.

c. Curb Ramps: Elevation shall be depicted with a minimum of three (3) elevations at bottom of the accessible ramp section (edge/center/edge), three (3) elevations at the top of the accessible ramp section (edge/center/edge), and one (1) elevation at the

center of the sloped segment (center). Elevation of flare (wings) sections (wings) shall be depicted with a minimum of three (3) elevations at each triangle corner.

4. Accessible Parking Spaces: Elevation of each Accessible Parking Space and elevation of each Access Isle shall be depicted with a minimum of four (4) elevations at each corner and one (1) elevation at the center, respectively.

C. Submit two prints of the final as-built drawings to Engineer prior to submittal of Application for Final Payment. As-Built Drawings shall show, but not necessarily be limited to, the following information:

1. Location, grade, elevations, cross-section, invert, and alignment of earthwork, above-grade construction, structures, field layouts, field markings, and equipment.

2. Measured horizontal and vertical locations of underground utilities, drainage systems and associated appurtenances, referenced to permanent surface improvements.

3. Field changes of dimension and detail.

4. Detail not on original Contract Drawings.

5. Changes or modifications which result from punch lists or final inspection.

D. After approval of final as-built drawings by Engineer, submit two copies of final as-built drawing on polyester film to the Owner. Final as-built drawings shall bear the seal and signature of the Connecticut-licensed Professional Land Surveyor.

E. Concurrent with submittal of as-built drawings, submit to Owner all Survey Data in native format with appropriate identifiers.

END OF SECTION

SECTION 01 7700

PROJECT CLOSE-OUT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Substantial Completion.

2. Inspections.

3. Final cleaning.

4. Final Acceptance.

5. Project record documents.

1.2 SUBMITTALS

A. Submit Close-Out Submittals as indicated herein. Provide other Close-Out submittals that may be called-for in other Specification Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for Certification of Substantial Completion, complete the following (list exceptions in the request).

B. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as Substantially Complete. Include supporting documentation for completion as indicated in the Contract Documents and a statement showing an accounting of changes to the Contract Sum if applicable.

C. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

D. Submit warranties, workmanship bonds, maintenance agreements, testing results, final certifications, and similar documents.

E. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

F. Deliver spare parts, extra stock, equipment, and similar items required.

G. Complete start up testing of systems, and instruction of the Owner’s operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock ups, and similar elements.

H. Complete final clean up requirements, including touch up painting. Touch up and otherwise repair and restore marred exposed finishes.

I. Coordinate temporary erosion and sedimentation control measures with permanent erosion control features to the extent practical to ensure economical, effective and continuous erosion control post-construction.

1.4 INITIAL CLOSE-OUT INSPECTION

A. On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements.

B. Following Initial Inspection, Engineer will prepare a list of items to be completed or corrected ("Punch List").

C. Engineer will prepare a Certificate of Substantial Completion following Initial Inspection, or advise Contractor of construction that must be completed or corrected before the certificate will be issued. If a Certificate of Substantial Completion is issues, the Punch List will be attached.

1.5 FINAL CLEANING

A. Remove all temporary controls unless otherwise indicated to remain.

B. Remove tools, construction equipment, machinery, and surplus materials.

C. Remove and properly dispose of all garbage, rubbish, litter, and other substances.

D. Clean exposed surfaces of installed equipment and similar items.

1.6 FINAL CLOSE-OUT INSPECTION

A. On receipt of a request for Final Inspection, Engineer will either proceed with inspection or advise Contractor of unfilled Punch List requirements.

B. Results of the Final Inspection will form the basis of requirements for final acceptance.

C. Engineer will repeat Final Inspection following notation of Punch List items that must be completed or corrected.

1.7 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final acceptance and final payment, complete the following (list exceptions in the request).

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum if applicable.

3. Submit Consent of Surety to final payment, and final lean releases (lien waiver) from all suppliers, subcontractors, and second-tier subcontractors.

B. Following completion of acceptable Close-Out Inspection and receipt of all required Close-Out Submittals, Engineer will prepare a certificate of final acceptance.

1.8 RECORD DOCUMENT SUBMITTALS

A. Record Drawings: In addition to Record Drawing requirements that may be defined in individual Specification Sections, at a minimum, maintain a clean, undamaged set of blue or black line white prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever Drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

5. Upon completion of the project, submit (2) copies of Record Drawings to Engineer.

B. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark up of Record Drawings and Specifications.

1. Upon completion of mark up, submit complete set of record Product Data to Engineer.

C. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Engineer.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

TECHNICAL SPECIFICATIONS

SECTION 02 4123

SITE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. General Site Demolition.

2. Demolition of site structures, retaining walls, signage, light standards, foundations and appurtenances, pavement, curbing, and similar site improvements.

3. Filling of voids and excavations resulting from site demolition.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. State of Connecticut.

1. State of Connecticut Solid Waste Management Regulations, Section 22a-209 including any amendments thereto.

1.3 DEFINITIONS

A. Demolition: Any operation including the dismantling or wrecking of a structure, assembly, appurtenance, or any portion thereof, including major and minor components, parts, and systems. Demolition shall be inclusive of the removal, handing, processing, segregation, loading, and proper off-site disposition of materials. Demolition shall be interpreted as complete and total removal unless otherwise indicated. The term Remove shall be synonymous with Demolition.

B. Bulky Waste: Land clearing debris and non-contaminated or hazardous waste material resulting directly from demolition activities other than Clean Fill, including such materials as tree stumps, tree tops, concrete, wood, brick, plaster, roofing materials, wallboard, metals, carpeting, insulation, furniture, and furnishings. Bulky Waste shall include Construction and Demolition Debris and Construction and Demolition Waste.

1.4 SAFETY

A. Conduct the work of this Section in conformance with applicable regulations, including those relating to warning signs, excavation safety, sheeting, shoring, and stabilization.

B. Provide and maintain barricades, signs, lights, etc., required for the protection of personnel, materials and property. Temporary barricades, etc. shall conform all applicable codes and regulations, and shall be lighted at night with lanterns, flares and reflectorized paint as required for safety. Adapt barricades, signs, lights, etc. to evolving site conditions throughout the progress of the work.

C. Provide other safety devices as required, including adaptation of such safety devices to changing site conditions, to prevent unauthorized entry to construction areas and open excavations. Provide warning signs and other temporary construction safety devices necessary for proper completion of the work in compliance with applicable safety regulations.

D. Contractor shall properly design and furnish all labor, materials, equipment, and tools necessary to construct permanent or temporary excavation support systems, including, but not necessarily limited to, sheet piling, trench shields, trench boxes, timber trench shoring, pneumatic/hydraulic shoring, steel sheeting or sheeting using other materials, sloping, and benching.

E. Any time an excavation is to remain open, at a minimum, provide full enclosure with safety barriers and fencing, warning signs, and additional safety control measures as appropriate for the condition.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.

B. Utility Mark-out

1. Prior to commencing work, comply with utility mark-out requirements of the Call-Before-You-Dig System (1-800-922-4455).

2. Verify the location of all subsurface utilities marked through the Call-Before-You-Dig System.

3. Not all subsurface facilities or structures will be identified through the Call-Before-You-Dig System. Confirm the location of other subsurface utilities and other subsurface facilities or structures prior to commencing work. Field-mark utilities as required.

C. Utility Coordination

1. Inform all utility owners of the necessity of test pit work. Provide reasonable advance notice to allow for coordination.

2. Coordinate the excavation of all test pits with the respective utility owners having facilities in the vicinity of the test pit location.

3. If so desired by the respective utility owners, all or part of the work under this Section may be accomplished by their crews and/or supervised by them.

1.6 REGULATORY REQUIREMENTS

A. Comply with all applicable federal, state, and local safety and health requirements regarding all aspects of the work. Do not proceed until all permits or other approvals are secured.

B. Contractor is bound to comply with any project-related permits or approval obtained by Owner, including all requirements of such permit and representations contained in permit application as though Contractor were the permittee. Requirements and conditions set forth in Owner-obtained project-related permits and permit applications shall be binding on Contractor just as any Specification would be.

C. Do not close or obstruct roadways, sidewalks, hydrants, or other infrastructure without permits or authorization from local municipal authorities or other authorities having jurisdiction.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 IDENTIFICATION OF EXISTING FEATURES

A. Prior to commencing construction activities, Contractor shall identify and delineate those areas or specific improvements that are not to be disturbed. Areas or specific improvements within the Limits of Work/Contract Limits and general work areas which are not to be disturbed shall be clearly marked or fenced. Monuments and markers shall be protected before construction operations commence. Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting designated areas, specific improvements, monuments, and markers at the Project Site.

3.2 PROTECTION OF EXISTING FEATURES

A. General

1. All areas or specific improvements, including but not limited to vegetation, utilities, poles, wires, fences, curbs, monuments/property-line markers, and other structures, which must be preserved in place without being temporarily or permanently relocated shall be carefully supported and otherwise protected from damage by Contractor.

2. As excavation/demolition work approaches underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools.

B. Pavements

1. On paved surfaces to remain, Contractor shall not use or operate heavy equipment, other power-operated equipment, or store tools, equipment, or materials which may mar, cut, or otherwise damage such surfaces. If there is no alternative to the operation of heavy equipment, other power-operated equipment, or storage of tools, equipment, or materials on paved surfaces to remain, Contractor shall take all measures necessary to protect such surfaces.

2. All surfaces, which have been damaged by Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of construction operations. Such restoration shall meet the approval of Engineer and may include repair or complete replacement at Contractor's expense.

C. Planted Areas

1. All planted areas, including lawn/turf areas and landscaped areas, which have been damaged by Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of construction operations.

D. Utilities

1. Locate and identify existing utilities that are to remain and protect them from damage. Provide protection as required such as marking, blocking, bracing, stabilizing, supporting, and retaining.

2. For utility termination, removal, or abandonment, refer to Section 02 4113 – Utility Demolition and Abandonment.

3. Before excavating near any utility, notify the utility owner, coordinate protective work, and comply with the utility owners' requirements.

4. All utility services shall be supported by suitable means so that the services shall not fail when tamping and settling occurs.

5. Where known utilities are encountered, notify Engineer and document location and type of utility before proceeding with work in such area.

6. When uncharted or incorrectly charted utilities are encountered, stop work and notify Engineer. Cooperate with the utility owners in maintaining their utilities in operation prior to resuming work.

E. Retaining Structures: Provide bracing, shoring, sheeting, sheet piling, underpinning or other retaining structures necessary to guard against any movement or settlement of existing or new construction, utility systems, paving, or other improvements. Contractor assumes responsibility for the strength and adequacy of retaining structures, and for the safety and support of construction, utilities or paving, and for any movement, settlement or damage thereto.

3.3 SITE DEMOLITION

A. Conduct site demolition as shown on the Drawings.

B. Conduct site demolition operations in a manner that will prevent damage to adjacent structures, utilities, pavements and other facilities to remain.

C. Remove from the site and properly dispose of all materials resulting from site demolition operations.

3.4 DUST CONTROL

A. Implement fugitive dust suppression to prevent unacceptable levels of dust resulting from site demolition operations or other activities required by the Contract Documents. It shall be the

Contractor's responsibility to supervise fugitive dust control measures and to monitor airborne particulate matter. Comply with applicable provisions of Section 01 5714 – Temporary Dust Control.

3.5 REPLACEMENT

A. In case of damage, Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. When the Owner does not wish to make the repairs themselves, all damage shall be repaired by Contractor, or, if not promptly done by him, Engineer may have the repairs made at the expense of Contractor.

B. Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged through the prosecution of work at no expense to Owner. All repair and replacement work shall match the existing in-kind. Final acceptance of said work shall be at the sole judgment of Owner.

END OF SECTION

SECTION 03 3200

SITE CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Site cast-in-place concrete, including but not necessarily limited to, sidewalks, ramps, driveways, curbing, pads, bases, retaining walls, and thrust blocks.

2. All facilities, labor, materials, tools, equipment, appliances, transportation, supervision, and related work necessary to complete the Work shown on the Drawings and as specified herein.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. ASTM International (ASTM)

1. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

2. ASTM A706 – Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

3. ASTM A767 – Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

4. ASTM A775 – Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

5. ASTM A996 – Standard Specification for Rail-Steel and Axle-Steel Deformed Bars or Concrete Reinforcement.

6. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

7. ASTM C29 – Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate

8. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
9. ASTM C33 – Standard Specification for Concrete Aggregates.
10. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
11. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
12. ASTM C70 – Standard Test Method for Surface Moisture in Fine Aggregate.
13. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
14. ASTM C117 – Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing.
15. ASTM C127 – Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
16. ASTM C128 – Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
17. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
18. ASTM C138 – Standard Test Method for Density ("Unit Weight"), Yield, and Air Content (Gravimetric) of Concrete.
19. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete.
20. ASTM C150 – Standard Specification for Portland Cement.
21. ASTM C156 – Standard Test Method for Water Retention by Concrete Curing Materials.
22. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete.
23. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
24. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
25. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
26. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
27. ASTM C233 – Standard Test Method for Air-Entraining Admixtures for Concrete.
28. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
29. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

30. ASTM C311 – Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.

31. ASTM C387 – Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.

32. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.

33. ASTM C566 – Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying.

34. ASTM C595 – Standard Specification for Blended Hydraulic Cements.

35. ASTM A 615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

36. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

37. ASTM C685 – Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.

38. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete.

39. ASTM C803 – Standard Test Method for Penetration Resistance of Hardened Concrete.

40. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.

41. ASTM C979 – Standard Specification for Pigments for Integrally Colored Concrete.

42. ASTM C989 – Ground Granulated Blast-Furnace Slag for Use in Concrete Mortars.

43. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.

44. ASTM A1078 – Standard Specification for Epoxy-Coated Steel Dowels for Concrete Pavement.

45. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

46. ASTM D1752 – Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

47. ASTM D2628 – Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

48. ASTM D4397 – Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.

49. ASTM D5249 – Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints.

50. ASTM D5893 – Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

51. ASTM E329 – Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

D. Concrete Reinforcing Steel Institute (CRSI).

1. CRSI Manual of Standard Practice, latest edition.

E. State of Connecticut

1. 2016 Connecticut State Building Code, including all Amendments, Supplements, and Errata.

F. American Concrete Institute (ACI)

1. ACI 224R – Control of Cracking on Concrete Structures.

2. ACI 224.3R – Joints in Concrete Construction.

3. ACI 301 – Specifications for Structural Concrete.

4. ACI 302.1R – Guide for Concrete Floor or Slab Construction.

5. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete.

6. ACI 305R – Guide to Hot Weather Concreting.

7. ACI 306R – Guide to Cold Weather Concreting.

8. ACI 308R – Guide to Curing Concrete.

9. ACI 318-14 - Building Code Requirements for Structural Concrete

10. ACI 318R-14 - Commentary on Building Code Requirements for Structural Concrete

G. American Welding Society (AWS).

1. AWS A5.1/A5.1M (2004; Errata 2004) Carbon Steel Electrodes for Shielded Metal Arc Welding.

2. AWS D1.4/D1.4M (2005; Errata 2005) Structural Welding Code – Reinforcing Steel.

1.3 SUBMITTALS

A. Sampling and Testing Laboratory – Submit name and qualifications of commercial sampling and testing laboratory for Engineer's approval. Submit applicable documentation of credentials, licenses, etc.

B. Testing Agency – Submit name and qualifications of third-party in-field quality control Testing Agency for Engineer's approval. Submit applicable documentation of credentials, licenses, etc.

C. For each type of specially furnished concrete provide a description of methods and the sequence of placement.

D. Manufacturer's catalog data for the following items shall include printed instructions for admixtures, bonding agents, epoxy-resin adhesive binders, waterstops, and liquid chemical hardeners:

1. Concrete Aggregates.
2. Portland Cement.
3. Ready-Mix Concrete.
4. Form Facing Materials.
5. Reinforcement Materials.
6. Joint Materials.
7. Water-Vapor Barrier Subgrade Cover.
8. Bonding Materials.
9. Finish Materials.
10. Concrete Curing Materials.
11. Form release agent.
12. Concrete coloring additive.
13. Elastomeric joint sealant.
14. Preformed joint filler

E. Submit samples of the following:

1. Preformed joint filler.
2. Manufacturer's color charts showing full range of colors available.
3. Cured samples of elastomeric join sealants in the color(s) selected.

F. Design Data

1. Mix Design data for each class of Ready-Mix Concrete shall be submitted at least 15 calendar days prior to start of specified work.
2. Mix Design data for each type of integrally-colored concrete mix called-for shall be submitted at least 15 calendar days prior to start of specified work.

G. Test Reports

1. Submit test reports for all testing conducted under this Section.

H. Certificates

1. Submit certificates for the following:
   a. Concrete Design Mixes.
   b. Concrete Aggregates.

c. Welding Procedures. Welding Procedures shall be in accordance with AWS D1.4/D1.4M. Certificates for Welder Qualifications shall be in accordance with the paragraph entitled, "Qualifications for Welding Work," of this section.

d. Mill certificates for Steel Bar.

2. Certificates for concrete shall contain project name, title/number, date, name of Contractor, name of concrete testing service, source of concrete aggregates, material manufacturer, brand name of manufactured materials, material name, values as specified for each material, and test results.

I. Manufacturer's Instructions

1. Installation instructions shall indicate the manufacturer's recommended method and sequence of installation for the following items:

a. Admixtures

b. Bonding Materials

c. Waterstops

d. Liquid Chemical Hardener

J. Joint Plan

1. Prior to initiation of concrete flatwork, submit proposed Construction Joint plan to Engineer for review and approval. Coordinate such plan with the joint patterns depicted on the Drawings.

K. Delivery Tickets: Ready-mixed concrete manufacturer shall provide delivery tickets with each load of concrete delivered to the Project Site. Delivery tickets shall provide the following information:

1. Project name printed on ticket.

2. Name of producer, identification of plant.

3. Date and time of day.

4. Type of material.

5. Cubic yards of material loaded into truck.

6. Project number, purchase order number, name of Contractor (if Contractor other than producer).

7. Truck number for specific identification of truck.

8. Individual aggregate, cement, water weights (masses) and any admixtures shall be printed on plant tickets.

9. Water/cement ratio.

10. Additional water allowance in gallons based on water/cement ratio for mix.

1.4 QUALITY ASSURANCE

A. Dimensions, locations, and details of equipment pads, anchors, supports, and similar features indicated on the Drawings are approximate. Manufacturer's approved shop drawings of equipment to be supported, anchored, or contained thereby shall be consulted for exact location, size and details.

B. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.

C. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.

D. Welder qualifications: Welder qualifications shall be verified in accordance with AWS D1.4/D1.4M or under an equivalent qualification test approved in advance. Welders shall be permitted to do only the type of welding for which each is specifically qualified.

E. Concrete testing: Concrete testing shall be performed by an approved Testing Agency/Testing Laboratory experienced in sampling and testing of concrete. Testing Agency/Testing Laboratory shall meet the requirements of ASTM E329.

1.5 MOCKUPS

A. Where mockups are called-for, comply with the following:

1. At location on the Project Site selected by Engineer, place and finish 100 square foot mockup section for examination. Mockup to be constructed by the installer who will actually perform the work for the Project.

2. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.

3. For colored concrete, record the amount of integral colorant, dray colorant, or chemical stain needed per square foot of application to establish coverage rates for the work.

4. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control construction, and expansion joints in sample panels.

5. Retain samples of cements, sands, aggregates and color additives used in mockup for comparison with materials used in remaining work.

6. Accepted mockup provides visual standard for all work.

7. Mockup shall remain through completion of work for use as a quality standard for finished work.

8. Provide suitable protections to preclude damage to mockup.

9. Remove mockup when directed.

1.6 TESTING

A. Quality control testing during construction shall be the responsibility of Contractor via Testing Agency and Testing Laboratory as applicable. Contractor shall retain and pay for the services of such Testing Agency/Testing Laboratory to perform all testing in accordance with applicable standards.

B. Testing shall include sampling and testing concrete materials proposed for use in the work and testing the design mix for each class of concrete.

C. Tests will be required to determine whether the concrete being produced complies with the standard of quality and strength as specified.

D. Additional Tests: Additional testing of in-place concrete shall be conducted when test results indicate that specified concrete strengths and other characteristics have not been attained. Additional testing shall consist of cored cylinders to determine adequacy of concrete or other non-destructive testing methods that may be approved by Engineer. Contractor shall pay for all such additional testing. Any holes made shall be patched by the Contractor at their expense.

E. Testing Standards

1. Sampling: ASTM C172. Collect samples of fresh concrete to perform tests specified.

2. Concrete aggregate materials proposed for use in the work shall be sampled and tested in accordance with ASTM C33.

3. Portland Cement shall be sampled and tested in accordance with ASTM C150.

4. Slump Tests: ASTM C143. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded.

    a. Frequency: Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete unless otherwise specified or called-for.

5. Air Content: ASTM C231 (primary method) or ASTM C173 (secondary method).

    a. Frequency: Test air-entrained concrete for air content at the same frequency as specified for slump tests.

6. Temperature Tests: ASTM C1064.

    a. Frequency: Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, unless otherwise specified or called-for, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

7. Compressive Strength Tests: ASTM C39. Make five test cylinders for each set of tests in accordance with ASTM C31. Take precautions to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve.

a. Frequency: Samples for strength tests of each mix design (class) of concrete placed each day shall be taken not less than once a day, nor less than once for each 150 cubic yards of concrete, nor less than once for each 5,000 square feet of surface area for slabs (including walks and sidewalks) or walls.

b. Standard: Each strength test result must be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f′c or if any strength test result falls below f′c by more than 450 psi, take a minimum of three cored cylinder samples from the in-place work represented by the low-test cylinder results and test. Concrete represented by core test is considered structurally adequate if the average of three cores is equal to at least 85 percent of f′c and if no single core is less than 75 percent of f′c. Retest locations represented by erratic core strengths. Remove concrete not meeting strength criteria and provide new acceptable concrete. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete

8. Cored cylinders: ASTM C42.

9. Penetration: ASTM C803.

F. Concrete Replacement: Failure of any test or to follow proper installation procedures will require that the concrete be removed and properly replaced at the Contractor's expense.

1.7 DELIVERY, STORAGE AND HANDLING

A. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturers' written recommendations.

B. Packaged materials shall be delivered to the project site in their original, unopened package or container bearing label clearly identifying manufacturer's name, brand name, material, weight or volume, and other pertinent information. Packaged materials shall be stored in their original, unbroken package or container in a weather-tight and dry place until ready for use in the work.

C. Unpackaged aggregates shall be stored to avoid excessive segregation, contamination with other materials or other size aggregates, or freezing.

D. Reinforcement and other metal items shall be protected from corrosion and shall be kept free from ice, grease, and other coatings that would destroy or reduce bond.

E. Colored Admixture: Comply with manufacturer's instructions. Deliver colored admixtures in original, unopened packaging. Store in dry condition.

1.8 PROJECT CONDITIONS

A. Pre-Job Conference

1. One week prior to placement of concrete, Contractor shall coordinate and host a coordination meeting to discuss concrete application schedule, materials, and methods.

B. Environmental Requirements

1. Avoid placing concrete if rain, snow, or frost is forecast within 24-hours.

2. Protect fresh concrete from rain, moisture, and freezing.

3. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT

A. Cement: ASTM C 150. One brand and type of cement shall be used for formed concrete having exposed-to-view finished surfaces.

B. Unless otherwise specified, cement shall be Type IA.

2.2 READY-MIX CONCRETE

A. Ready Mix Concrete: Portland Cement Concrete, air-entrained, ASTM C94.

1. Compressive Strength:

a. Unless otherwise indicated, minimum compressive strength at 28 days shall be 4,000 psi minimum.

b. Sidewalks, stairs and landings, pedestrian and vehicle ramps, and curbing: Minimum compressive strength at 28 days shall be 4,400 psi minimum.

2. Water/cement ratio: Maximum 0.45.

3. Air content by volume: 6 percent ± 1 percent, ASTM C231 (primary method) or ASTM C173 (secondary method).

4. Slump: no less than 2 inches, not greater than 4 inches, ASTM C143.

5. Standard Color: Natural grey.

6. Colored Concrete: See the Article “Integral Colorant” herein if applicable.

B. Aggregate

1. Coarse aggregate: ASTM C33. Broken stone or gravel consisting of clean durable fragments of uniform quality throughout. It shall be free from soft, disintegrated pieces, mud, dirt, organic or other injurious material. Coarse aggregate of a size retained on a 1-inch square opening sieve shall not contain more than 8% of flat or elongated pieces, whose longest dimension exceeds five times their maximum thickness.

2. Fine aggregate: ASTM C33. Sand consisting of clean, hard, durable, uncoated particles of quartz or other rock, free from lumps of clay, soft or flaky material, loam, organic or other injurious material. Fine aggregate shall contain not more than 3% of material finer than a #200 sieve, ASTM C117.

C. Water: Potable quality.

D. Admixtures

1. Concrete shall contain a water reducing agent, ASTM C494, to minimize cement and water content of the concrete mix at the specified slump.

2. Air-Entraining Admixtures: ASTM C260.

3. Pozzolan: Fly ash or other pozzolans used as admixtures shall conform to ASTM C618, Class C or Class F with 4 percent maximum loss on ignition. Pozzolan may be used to replace a maximum of 15 percent (15 %) of cement by weight.

4. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixtures other than those specified shall be used in the concrete without the specific written permission of Engineer in each case.

2.3 FORMS

A. Forms shall be substantially built and adequately braced so as to withstand the liquid weight of concrete without deforming. All linings, studding, walling and bracing shall be such as to prevent bulging, spreading, or loss of true alignment while pouring and displacement of concrete while setting.

B. All edge forms for sidewalk pavements, curbs and gutters shall be of sufficient rigidity and adequately braced to accurately maintain line and grade. Form work shall be designed so that sections may be fastened together to prevent vertical or horizontal movement of ends.

C. Forms for curved sections shall be so constructed and placed that the finish surface of walls and edge of sidewalks, curbs and gutters will not deviated appreciably from the arc of the curve.

D. Exposed vertical and horizontal edges of the concrete in structures shall be chamfered as indicated on the Drawings by the placing of moldings in the forms.

E. Forms for Exposed Finish: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials. Form work materials shall produce a smooth, continuous, straight, and level surface.

1. Plywood shall be APA A-A, A-B or A-C, Class 1, Exterior Grade. Thickness shall be as required to prevent movement or deformation but shall not be less than 5/8″ thick.

F. Forms for Non-Exposed Finish: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials. Form work materials shall produce a generally smooth, continuous, straight, and level surface. Grain patterns or similar imperfections are acceptable. Lumber shall be dressed on at least two edges and one side.

1. Plywood shall be at least B-B, Class 1, Exterior Grade. Thickness shall be as required to prevent movement or deformation but shall not be less than 5/8″ thick.

G. Cylindrical Forms: Sonotube Fibre Forms, wax-impregnated strippable forms or ABS or PVC plastic reusable forms.

H. Form Ties: Provide prefabricated, adjustable length galvanized steel snap-off ties, with brackets, cones, corner locks and other accessories as necessary.

I. Form Release Agent: Commercial formulation compounds that will not bond with, stain or adversely affect concrete.

2.4 REINFORCEMENT MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60 unless otherwise indicated.

B. Galvanized Reinforcing Bars: ASTM A 767, Class II with galvanizing before fabrication.

C. Weldable Reinforcing Bars: ASTM A 706, Grade 60 unless otherwise indicated. Maximum carbon content shall be 0.55 percent.

D. Epoxy-Coated Reinforcing Bars: ASTM A 775, Grade 60 unless otherwise indicated.

E. Steel Wire: ASTM A 82, 16 gauge or heavier black annealed wire.

F. Welded Wire Reinforcement (WWR)

1. Sidewalks: Plain wire, ASTM A1064 as indicated on the Drawings.

2. Concrete Pavement: Plain wire, ASTM A1064 as indicated on the Drawings.

G. Supports for Reinforcement

1. Supports shall include bolsters, chairs, spacers, and other devices necessary for proper spacing, supporting, and fastening reinforcing bars and wire reinforcement in-place. Conform with CRSI Manual of Standard Practice for corrosion-resistant, plastic-protected wire, epoxy-coated, or stainless-steel supports.

H. Dowel Bars: Plain (smooth) high-chrome steel bar, ASTM A615 Grade 60 with full-length plastic sleeve as a combined unit, dimensions as indicated on the Drawings.

1. Where epoxy-coated dowels are called for: ASTM A1078.

I. Bar/Dowel Adhesive: Two component (1:1 ratio), 100% solids, high modulus, moisture-insensitive structural epoxy gel designed specifically for bonding bars, dowels, and bolts in concrete.

2.5 JOINT MATERIALS

A. Preformed Joint Filler Strips, Sidewalks and Concrete Paving.

1. Where no joint sealant is called-for: Nonextruding and resilient bituminous type conforming to ASTM D 1751, 1/2-inch-thick, one piece for the full depth and width of the joint.

2. Where joint sealant is called-for: Nonextruding and resilient nonbituminous type conforming to ASTM D 1752, Type I (sponge rubber) or Type II (cork), 1/2 inch thick, allowance for sealant at top and extending for the full depth and width of the joint.

B. Preformed Joint Filler Strips, General Use/Isolation Joints

1. Polyethylene, closed-cell expansion joint filler, ASTM D 4819, Type II.

C. Joint Sealant Compound, ASTM C920

1. Self-Leveling (Type SL; Grade “P”)

a. Cold-applied and self-leveling, Type S or Type M elastomeric polymer sealant.

2. Gun-Grade (Non-Sage; Grade “NS”)

a. One-component (Type S) high-performance moisture-curing polyurethane sealant specifically formulated for bonding to masonry and concrete.

3. Traffic Bound areas: T sealant.

4. Non-Traffic Bound areas: NT sealant.

5. Color: As approved by Engineer.

6. Backer material: ASTM D5249, closed cell.

2.6 DETECTABLE WARNING PANEL

A. Surface-mount, UV-stabilized, polymer composite panel as indicated on the Drawings. Fasteners, adhesives, and sealants per manufacturer's requirements. Panel shall comply with Connecticut Building Code/ADA Guidelines.

1. Color: As approved by Engineer.

B. Duralast Detectable Warning Plate with Black Asphaltic Coating, Product Number 00700570 as manufactured by East Jordan Iron Works, 301 Spring Street, East Jordan, MI or approved equal.

2.7 CONCRETE BONDING MATERIALS

A. Aqueous-phase, film-forming, nonoxidizing, freeze and thaw-resistant compound suitable for brush or spray application conforming to ASTM C 932.

B. Epoxy-Resin Adhesive Binder: Two-component, penetrating high solids, epoxy-based primer/bond coat, 100% solids, moisture-tolerant, ASTM C-881, Types I, II, and V, Grade-2, Class C and AASHTO M-235.

2.8 CONCRETE CURING MATERIALS

A. Curing shall be by moist curing (preferred) or by use of curing compound. Sodium Silicate curing compounds shall be used where required by the weather, approved construction schedules and construction that is not adaptable to damp curing.

B. Curing compound shall be a resin-base, white pigmented compound, ASTM C309, Type 2.

C. Curing compounds shall contain a fugitive dye or when hot weather conditions dictate, a fugitive heat reflecting pigment.

D. Moisture-Retaining Cover:

1. Waterproof paper, ASTM C 171, regular or white.

2. Polyethylene sheeting, ASTM C 171.

3. Polyethylene-coated burlap consisting of a laminate of burlap and a white opaque polyethylene film permanently bonded to the burlap. Burlap: ASTM C 171, Class 3. Polyethylene film: ASTM C 171.

4. When tested for water retention in accordance with ASTM C 156, weight of water lost 72 hours after application of moisture retaining covering material shall not exceed 0.039 gram per square centimeter of the mortar specimen surface.

E. Water: Potable Quality.

F. Membrane-Forming Curing Compound

1. Liquid type, ASTM C 309, Type 1, clear, Type 2, white, pigmented.

2.9 BOND BREAKER

A. Asphalt felt conforming to ASTM D2626, Type I or 6-mil polyethylene sheeting, ASTM D4397.

2.10 SEALER

A. Consolideck® Saltguard® silane/siloxane water repellent and chloride screen as manufactured by Prosoco, Inc., 3741 Greenway Circle, Lawrence, KS 66046, or approved equal. Gloss or flat sealer type as selected by Owner.

PART 3 EXECUTION

3.1 GENERAL

A. Verify site conditions before proceeding with the work. Field check the accuracy of the Drawings and inspect structures, utilities, and other site features prior to start of work and notify Engineer in writing, of any hazardous conditions and/or discrepancies.

B. Provide construction techniques in accordance with applicable provisions of ACI 224R, ACI 224.3R, and ACI 302.1R-04.

C. Engineer shall be notified of concrete placement sufficiently in advance of start of operation to allow their representative to complete preliminary inspection of the Work, including subgrade, forms, and reinforcing steel, if used.

D. Adjacent work, etc., shall be protected from stain and damage during entire operation. Damaged and stained areas shall be replaced or repaired to equal their original conditions at the contractor’s expense. No concrete walks shall be poured after 12 noon unless a guard is visibly stationed nearby to prevent graffiti. Contractor shall be responsible for replacing any graffiti if he fails to provide adequate protection.

E. Concrete surface shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, 1/2-inch thick plywood sheets shall be used to protect exposed surfaces.

F. Retempering of concrete is not permitted.

G. Contractor is responsible for the protection and resetting of all existing utility covers/castings to finish grade; as well as, setting all new utility covers/castings to finish grade prior to placement of concrete. The repair of any settlement, or protrusion above finish grade, shall be the responsibility of Contractor at no additional cost to Owner.

3.2 PREPARATION OF SUBGRADE

A. Compact and bring area to required subgrade elevation in accordance with Section 31 2310 – Earthwork. Provide for final fine grading, and compaction of areas as required to form a firm, uniform, accurate and unyielding subgrade at required elevations and to required lines.

B. Existing subgrade material, which will not readily compact as required, shall be removed and replaced with satisfactory materials in accordance with Section 31 2310 – Earthwork.

C. Subgrade of areas to receive concrete shall be recompacted as required to bring the top 8 inches of material, immediately below the base course, to a compaction at optimum moisture content of at least 95 percent (95%) of maximum density, as determined by ASTM D1557. Subgrade compaction shall extend for a distance of at least 1 foot beyond pavement edge.

D. Materials shall not be stored or stockpiled on subgrade.

E. Disposal of debris and other material excavated under this section, and material unsuitable for, or in excess of requirements for, completing work of this section shall be disposed of off-site.

F. Prepared subgrade shall be inspected and approved by Engineer Representative before installation of the gravel base course. Disturbance to subgrade caused by inspection procedures shall be repaired under this Section of the Specification.

3.3 AGGREGATE BASE COURSE

A. Prepare aggregate base course for concrete in accordance with Section 31 2310 – Earthwork and as shown on the Drawings.

B. Width of base course shall be greater than or equal to the width of concrete surface, if continuous lateral support is provided during rolling. The width of base course shall extend at least 2 x base thickness beyond the edge of the course above, if it is not so supported.

C. Aggregate shall be applied in lifts less than or equal to 6 inches thick, compacted measure. Each lift shall be separately compacted to specified density.

1. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade and level.

2. The base shall be wetted and rolled or tamped after the spreading of each lift.

3. Rolling shall begin at the sides and progress to the center of crowned areas, and shall begin on the low side and progress toward the high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheels.

4. Surface irregularities, which exceed 1/2-inch, as measured by means of a 10-foot long straightedge, shall be replaced and properly re-compacted.

D. Density: Base course shall be compacted at optimum moisture content to not less than 95 percent of maximum density as determined by ASTM D1557.

E. Subgrade and base course shall be kept clean and uncontaminated. Less select materials shall not be permitted to become mixed with gravel. Materials spilled outside pavement lines shall be removed and the area repaired.

F. Portions of subgrade, or of construction above, which become contaminated, softened, or dislodged by the passing of traffic, or otherwise injured, shall be cleaned, replaced, or otherwise

repaired to conform to the requirements of this specification before proceeding with the next operation.

3.4 FORMS

A. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Complete and approve formwork. Remove debris and foreign material from interior of forms before start of concrete placing.

D. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain indicated elevations and contours in finished slab surface and must be strong enough to support vibrating bridge screeds or roller pipe screeds if nature of specified slab finish requires use of such equipment. Align concrete surface to elevation of screed strips by use of strike-off templates or approved compacting-type screeds.

E. The maximum cross slope for sidewalks shall be 2.0 percent, sloped towards the gutter. Verify formwork prior to concrete placement. Make corrections as required and bring discrepancies to attention of Engineer.

3.5 JOINTS

A. Locate joints as located on the Drawings, as shown on Engineer-approved joint plan. Conform with applicable sections of ACI 224.3R.

B. Construction Joints: Effected at the end of a pour, lift, or at the end of a day's concrete placement. This type of joint is a plane surface between two distinct sections of concrete.

1. Construction Joints shall be ½ inch wide and full-depth of slab.

2. Joint filler: Unless otherwise specified, Construction Joints shall be constructed with joint filler. Joint filler shall extend the full depth of the slab and shall extend the full length of the joint. Use of multiple pieces of joint material of lesser dimensions to make up required depth and width of joint will not be permitted.

3. Where joints are to receive filler, recess joint filler 1/4-inch below finish surface or as otherwise indicated on the Drawings.

4. Where called-for on the Drawings, install dowels at Construction Joints.

C. Isolation Joints: Installed at intersections of structures on any type including but not limited to buildings, walks with steps, pre-cast concrete curb, light foundations, walls, pads, slabs at footings, or other structures. Isolation Joints shall not be required where concrete flatwork abuts granite curbing.

1. Isolation Joints shall be ½ inch wide.

2. Joint Filler: All Isolation Joints shall be constructed with joint filler. Joint filler shall extend the full depth of the slab and shall extend the full length of the joint. Use of multiple pieces

of joint material of lesser dimensions to make up required depth and width of joint will not be permitted.

3. Where joints are to receive filler, recess joint filler 1/4-inch below finish surface or as otherwise indicated on the Drawings.

D. Control/Contraction Joints: Installed to form a weakened plane in a concrete member to provide a reduction in member thickness for the purpose of controlling shrinkage stresses to that specific area. Control/Contraction Joints shall be synonymous with "Dummy Joints."

1. Control/Contraction Joints shall be tooled or saw-cut.

a. Tooled joints: Tool-form joint into the concrete 1 inch in depth, but in no case less than 25 percent of slab depth. Joint width shall be 1/4-inch. Each side of tooled joint shall be dressed to match final overall slab finish. Joint shall be made after concrete is finished and when the surface is stiff enough to support the weight of workmen without damage to the slab, but before the slab has achieved its final set.

1) Where tooled joints are to receive joint sealant, provide 1/2-inch wide tooled joint and install backer rod material to create 1/4-inch recess below finished surface.

b. Saw-cut joints: Saw-cut joint into concrete 1 inch in depth, but in no case less than 25 percent of slab depth. Joint width shall be 1/8-inch. Cut joint using rotary saw within 4 to 12 hours after the concrete has been finished.

3.6 STEEL REINFORCEMENT

A. Install steel reinforcement as shown on the Drawings in accordance with ACI 318.

B. Before being placed in position, reinforcing shall be thoroughly cleaned of loose mill and rust scale, dirt, ice, and other foreign material, which may reduce the bond between the concrete and reinforcing. Where there is a delay in placing concrete after reinforcement is in place, reinforcement shall be re-inspected and cleaned when necessary.

C. Welded Wire Reinforcement

1. Where WWR is called-for, install material in the upper 30 to 40 percent (30%–40%) of the overall slab thickness, or at the nearest depth below top of slab as required to achieve a minimum of 2-inches of cover.

2. Adjacent sheets of welded wire reinforcement shall lap 6 inches.

D. Reinforcing bar

1. Any bar showing cracks after bending shall be discarded.

2. Minimum Cover: 2 inches, except where concrete is cast against and permanently exposed to earth minimum cover shall be 3 inches.

3. For slab-type construction, reinforcing bars shall be elevated off the base material by use of supports as specified herein.

4. Adjacent reinforcement bars shall lap a distance equivalent to 40 bar diameters. All laps shall be tied.

E. Joints

1. Construction Joints: Reinforcement shall not continue through construction joints. Allow for 2-inches of cover at end of slab. Where called-for on the Drawings, install pins at Construction Joints per detail.

2. Isolation Joints/Expansion Joints: Allow for 2-inches of cover at end of slab.

3. Control/Contraction Joints: Cut at least one-half of reinforcement at joints.

F. Reinforcing shall be securely wired in the position called for, and shall be maintained in that position until concrete is placed and compacted.

3.7 PLACEMENT

A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint, and other material which might tend to reduce bond.

B. Existing concrete, earth, forms, and other water-permeable material against which new concrete is to be placed and shall be thoroughly damp when concrete is placed. There shall be no free water on the surface.

C. Concrete shall arrive at the job site in a timely manner so that no additional water will be required to produce the desired slump. When conditions develop that require the addition of water to produce the desired slump, permission of the Engineer must be obtained. The concrete shall be transported from the mixer to its place of deposit by a method that will prevent segregation or loss of material.

D. Concrete, which has set, or partially set, before placement shall not be employed.

E. Existing concrete, earth, and other water-permeable material against which new concrete is to be placed shall be thoroughly damp when concrete is placed. There shall be no free water on surface.

F. Concrete shall be thoroughly spaded and tamped to secure a solid and homogeneous mass, thoroughly worked around reinforcement and into corners of forms.

G. When joining fresh concrete to concrete which has attained full set, the latter shall be cleaned of foreign matter, and mortar scum and laitance shall be removed by chipping and washing. Clean, roughened base surface shall be saturated with water, but shall have no free water on surface. A coat of 1:1 cement-sand grout, approximately 1/8-inch thick shall be well scrubbed into thoroughly dampened concrete base. New concrete shall be placed immediately, before grout has dried or set.

3.8 FINISHING

A. Concrete flatwork surfaces shall be screened off and finished true to line and grade, and free of hollows and bumps. Surface shall be dense, smooth, and at exact level and slope required.

1. Finished concrete surface for concrete subbase shall be woodfloated to a slightly rough surface. Surface shall not deviate more than 1/4-inch in 10 feet.

2. Finished concrete surface for concrete pavement, walks, and pads shall be wood-floated and steel troweled to a smooth surface. Surface shall not deviate more than 1/8-inch in 10 feet.

B. Unless otherwise indicated, horizontal surfaces of concrete surfaces, which will be exposed, shall be given a light broomed finish, with direction of grooves in concrete surface perpendicular to length of concrete band, slab or pad. After concrete has set sufficiently to prevent coarse aggregate from being torn from the surface, but before it has completely set, brooms shall be drawn across it to produce a pattern of small parallel grooves. Broomed surface shall be uniform, with no smooth, unduly rough or porous spots, or other irregularities. Coarse aggregate shall not be dislodged by the brooming operation.

C. Immediately following finishing operations, arises at edges and both sides of expansion joints shall be rounded to a ¼ inch radius. Control joints to be tooled shall be scored into slab surface with scoring tool. Adjacent edges of control joint shall be same time be finished to a ¼ inch radius.

D. Where finishing is performed before the end of the curing period, concrete shall not be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

3.9 CURING

A. Cure in accordance with ACI 308R.

B. Concrete shall be kept continuously damp from time of placement until the end of the specified curing period.

C. Water shall not be applied to curing concrete within 24 hours after initial placement. Any water shall be applied only to maintain damp conditions. Do not add water during floating and troweling operations.

D. Between finishing operations, the surface shall be protected from rapid drying by covering with a material specified herein. Surface shall be damp when the covering is placed over it, and shall be kept damp by means of fine-spray of water, applied as often as necessary to prevent drying after the initial 24-hour cure period.

E. Concrete surfaces shall be cured by completely covering them with curing paper or an application of a curing compound.

1. Concrete cured using waterproof paper shall be completely covered with paper with seams lapped and sealed with tape. Concrete surface shall not be allowed to become moistened between 24 and 36 hours after placing concrete. During curing period surface shall be checked frequently, and sprayed with water as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.

2. If concrete is cured with a curing compound, the compound shall be applied at a rate of 200 square feet per gallon, in two applications perpendicular to each other.

3. Curing period shall be seven days minimum. Full-strength shall be considered after 28 days.

F. Only if additional protection is required, the surface should remain uncovered for at least 4 days, after which time new and unwrinkled non-staining reinforced waterproof Kraft curing paper may be used.

3.10 COLD WEATHER CONCRETING

A. Comply with ACI 306R Guide to Cold Weather Concreting.

B. Materials for concrete shall be heated for concrete, which is mixed, placed or cured when the mean daily temperature is below 40 degrees F or is expected to fall below 40 degrees F within 72 hours. The concrete, after placement, shall be protected by covering, heat, or both.

C. Details of handling and protecting concrete during freezing weather shall be subject to the approval of Engineer.

3.11 HOT WEATHER CONCRETING

A. Comply with ACI 305R: Guide to Hot Weather Concreting.

B. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placement shall be sprinkled with cold water. Every effort shall be made to minimize delays that will result in excessive mixing of the concrete after arrival on the job.

C. During periods of excessively hot weather (95□F, or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305R. Any concrete with a temperature below 95□F, when ready for placement, will not be acceptable, and will be rejected.

D. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. Records shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the Work so that conditions surrounding the construction of any part of the structure can be ascertained.

3.12 PROTECTION

A. Concrete surface shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, ½ inch thick plywood sheets shall be used to protect the exposed surface.

3.13 CLEAN UP

A. Remove all debris, residuals, and materials at the conclusion of the work. Dispose of all materials in accordance with applicable waste management regulations.

3.14 SEALANT

A. Apply concrete sealer to sidewalks, steps, and pads after cure period in accordance with manufacture's guidelines.

END OF SECTION

11 6823.33

TENNIS EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Furnishing and installing tennis court equipment of the type and size indicated on the Drawings, including all primary components and appurtenances.

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. ASTM International (ASTM).

1. ASTM A36 - Structural Steel.

2. ASTM A90- Standard Test Method for Weight (Mass) of Coating on Iron or Steel Articles with Zinc or Zinc Alloy.

3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.

4. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

5. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.

6. ASTM C94- Standard Specification for Ready-Mixed Concrete.

7. ASTM D822 - Tests on Paint and Related Coatings Using Filtered Open-Flame Carbon-Arc Exposure Apparatus.

8. ASTM D1640 - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature.

9. ASTM D1794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

10. ASTM D3363 - Test Method for Film Hardness by Pencil Test.

11. ASTM F844 - Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.

12. ASTM F1083- Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

13. ASTM F 2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

D. United States General Services Administration, Federal Standards.

1. Federal Standard No. 595 - Colors Used in Government Procurement.

1.3 SUBMITTALS

A. Shop drawings for all equipment furnished under this Section. Shop drawings shall indicate the configuration, dimensions, layout, and spacing of major and minor equipment components such as posts, supports, rails, brackets, fasteners, foundations, anchorage, and a schedule of such equipment components. Show in large-scale details any unique fabrication, assembly, and/or installation requirements.

B. Material certificates or other data indicating compliance with these Specifications for finish type, color, size, style, posts, fittings, hardware, and accessories.

C. Copies of manufacturer-provided installation instructions, operation instructions, and maintenance material for all equipment furnished under this Section.

D. Manufacturer’s warranties and associated warranty registration data in Owner’s name. Submit two (2) copies of each warranty to Engineer in the manufacture’s/supplier's standard form or if there is no standard form available, in a form specified by Engineer.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in packed cartons or other protective packaging.

B. Deliver, move, store, or otherwise handle equipment to avoid damage.

C. Damaged equipment shall not be installed. Contractor shall bear responsibility for damage to equipment until final acceptance by Owner. Any installed equipment exhibiting damage shall be replaced or repaired to the satisfaction of Engineer, and Contractor shall assume all costs related thereto.

1.6 WARRANTY

A. Provide manufacturer’s standard warranty, as applicable, for all products furnished under this Section. Warranty shall be registered in Owner’s name.

B. Bind warranties in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

C. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.

D. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of Contractor.

E. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS

2.1 NET POSTS

A. Three (3) inch O.D., 11-gauge steel posts with internal, self-locking gear mechanism, model Preimer RD as supplied by Douglas Industries, Inc., Eldridge, IA, website: www.douglas-sports.com or approved equal.

B. Gears shall be constructed of plated steel and case hardened with gear ratio of 30:1 for smooth operation.

C. Provide 24 inch long galvanized steel ground sleeves with PVC end plugs sized to accept net post.

D. Finish: Polyester powder coat.

1. Color: Green

E. Provide two (2) net posts for each court.

2.2 TENNIS NET

A. Base: Douglas TN-28DM Tennis Net #30060 as supplied by Douglas Industries, Inc., Eldridge, IA, website: www.douglas-sports.com or approved equal.

B. Size: 41’-9” x 3’-6”. Meet all USTA and CIAC requirements.

C. Material

1. Cable: 47’ long 5/32” vinyl coated galvanized steel looped at each end.

2. Headband: Polyester web headband lock sewn with four rows of white polyester thread.

3. 1 3/4” square mesh, 3.5mm braided solid core polyethylene. Top 6 rows shall be double mesh.

4. Black vinyl side pockets with fiberglass dowels.

5. Lacing Cord: 3mm braided polyethylene.

6. All grommets, clips and metal accessories shall be stainless steel.

D. Provide one (1) net for each court.

2.3 CENTER STRAP

A. 2 inch polyester white web, with nickel plated non-slip reverse web slide and double ended snap.

2.4 WINDSCREEN (ALTERNATE NO.3)

A. Wind screen shall be provided as shown on plans along the entire length of the tennis court perimeter fence and gates on the south sides of the courts. Provide manufacturer's recommended break-away fasteners.

1. Windscreen shall be 9' height, vinyl coated polyester mesh, with reinforced perimeter hem and brass grommets every 12" on center and at corners.

2. Mesh fabric shall be 9x12 polyester, with 9x12 1000 denier polyester base fabric, 8 oz. per square yard, 80% closed mesh, with double-stitched perimeter seam using #6 bonded polyester thread, and #2 brass grommets. Fabric, thread, and components shall be UV, rot, mildew, and flame resistant.

3. Verify lengths in field prior to ordering.

4. Graphic: Provide one (1) custom printed, three (3) color logo and two (2) color text (WILDCATS).

2.5 CONCRETE

A. Conform with the requirements of Section 03 3200 – Site Cast-in-Place Concrete.

2.6 SAND

A. Masonry Sand: Clean, hard, durable, uncoated particles of quartz or other rock. It shall not contain more than 3% of material finer than a #200 sieve.

2.7 PRIMER

A. Waterborne primer, acrylic or modified acrylic, suitable for use on exterior metal surfaces.

B. Drying time. The dry-to-touch time shall be a maximum of one hour, and the dry-to-recoat time shall be a maximum of 4 hours when tested in accordance with ASTM D 1640.

2.8 PAINT

A. Waterborne paint, acrylic or modified acrylic, suitable for use on exterior metal surfaces

B. Drying time. The dry-to-touch time shall be a maximum of one hour, and the dry-to-recoat time shall be a maximum of 4 hours when tested in accordance with ASTM D 1640.

C. Color: FS 13591 (yellow).

PART 3 EXECUTION

3.1 GENERAL

A. Fabricate and install all court components as indicated on the Drawings and in conformance with approved Shop Drawings.

B. Install court components with accessories furnished by the manufacturer as required for a complete and finished installation.

END OF SECTION

SECTION 31 2310

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Preparation and grading subgrades for slabs-on-grade, walks, pavements, and landscaping.

2. Excavating and backfilling for structures.

3. Excavation and backfilling for underground utilities and associated appurtenances.

4. Excavation, backfill and compaction for the demolition/removal of subsurface utilities and improvements.

5. Earth retention systems.

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 GENERAL

A. Contractor is advised that lines and grades, as shown on the Drawings, are subject to change. Although it is intended to adhere to what is shown on Drawings, Engineer reserves the right to make changes in lines and grades of utilities or other subsurface construction when such changes may be necessary or advantageous.

B. In open trenching on public roadways, Contractor shall be governed by the conditions, restrictions and regulations made by the local or state authority as applicable. All such regulations shall be in addition to those set down in the Specifications.

1.3 EXCAVATION CLASSIFICATIONS

A. Excavation - Excavation shall be unclassified and no consideration will be given to the nature of the materials. Excavation shall comprise and include the satisfactory removal and disposal of all materials encountered regardless of the nature of the materials and shall be understood to include but not limited to earth, fill, boulders, foundations, pavements, curbs, piping, cobbles, stones, footings, bricks, concrete, previously abandoned drainage structures and utility structures abandoned and not removed by the utility and debris.

B. Common Excavation - Excavation of all materials that can be excavated, moved, loaded, transported, and unloaded using heavy equipment or that can be excavated and dumped into place or loaded onto hauling equipment by excavation equipment (shovel, bucket, backhoe, dragline, or clam shell) or moved with dozer-type equipment, appropriate to the material type, character, and nature of the materials. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not in itself sufficient cause to change the classification of the surrounding material. All Common Excavation shall be included in the Base Bid.

C. Rock Excavation - Rock Excavation as defined herein. The excavation and removal of isolated boulders or rock fragments larger than 1 cubic yard encountered in materials otherwise conforming to the definition of Common Excavation shall be classified as rock excavation. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not in itself sufficient cause to change the classification of the surrounding material.

1.4 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. State of Connecticut Department of Transportation (ConnDOT)

1. Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016 and any supplements.

C. Code of Federal Regulations (CFR)

1. 29 CFR 1926, Safety and Health Regulations for Construction

D. American Concrete Institute (ACI)

1. ACI 229R-99 - Controlled Low-Strength Materials (CLSM).

E. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO Method T 90 - Determining the Plastic Limit and Plasticity Index of Soils.

2. AASHTO T104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.

3. AASHTO Method T146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test.

F. ASTM International (ASTM).

1. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils.

2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3(2,700 kN-m/m3)).

4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

5. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

7. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.5 DEFINITIONS

A. Backfill: Soil material or flowable concrete used to fill an excavation.

B. Bedding Course: Layer placed over the excavated sub-grade in a trench before laying pipe.

C. Benching: A method of limiting cave-in potential by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Clearing: Clearing shall consist in the felling, cutting up, and satisfactory disposal of trees and other vegetation designated for removal in accordance with these specifications.

F. Drainage Course: Layer supporting basement grade used to minimize capillary flow of pore water.

G. Earth Retention Systems: Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.

H. Excavation: Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

1. Additional Excavation: Excavation beyond required dimensions or below subgrade elevations that is requested and/or directed by Engineer. Additional Excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.

3. Unauthorized Excavation: Excavation below the elevations specified on the plans, beyond the limits indicated on the plans, or where no dimensions are indicated, beyond depths, elevations, and dimensions reasonably necessary for construction of the work without the request and/or direction of the Engineer. Unauthorized excavation, as well as any remedial work directed by Engineer, or if applicable Geotechnical Engineer, shall be without additional compensation.

I. Fill: Soil materials used to raise existing grades.

J. Finished Grade: The proposed final elevations shown on the Drawings or called for in the Specifications.

K. Geotechnical Engineer: A qualified and licensed entity designated for the project as the authority on the assessment, design, and oversight of soil and/or rock conditions and construction affected by such conditions.

L. Geotechnical Testing Agency: An independent testing agency employed by Owner, or by Contractor is called-for, and qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

M. Grubbing: Grubbing shall consist of the removal of roots 1 ½ inch and larger, organic matter and debris, and stumps having a diameter of three inches or larger, to a depth of at least 18 inches below the surface and or subgrade; whichever is lower, and the disposal thereof.

N. Protective System: A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

O. Regular Excavation: Removal and disposal of any and all material above subgrade elevation, except solid rock and undercut excavation, located within the limits of construction.

P. Rock: Solid ledges, bedded deposits, unstratified masses and conglomerations of material so firmly cemented as to possess the characteristics of solid rock which cannot be removed without systematic drilling or hoe ramming. All boulders containing a volume of more than one (1) cubic yard shall be considered rock.

Q. Rock Excavation: Removal and satisfactory disposal of Rock, which, in the opinion of Engineer, cannot be excavated except by drilling, wedging, jack hammering or hoe ramming or the excavation of boulders or rock fragments containing a volume of more than one (1) cubic yard. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not in itself sufficient cause to change the classification of the surrounding material.

R. Licensed Professional Engineer: A person who is licensed as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

S. Satisfactory Materials: Earth material that meets the classification, use, and/or gradation requirements herein that does not contain limestone, shale, clay, ash, slag, friable material, organic or vegetative materials, topsoil, wood, trash, broken concrete, masonry rubble, trash, refuse, or frozen materials.

T. Shield System: A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

U. Sloping: A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

V. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

W. Sub-grade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below drainage fill.

X. Surplus Material: Excavated acceptable material that cannot be utilized elsewhere on the site as backfill or embankment fill, or as otherwise directed by the Engineer.

Y. Temporary Dewatering System: A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.

Z. Testing Laboratory: A qualified entity engaged to perform specific laboratory tests.

AA. Testing Agency: A qualified entity engaged to collect samples, perform specific in-field tests, and/or inspections. The Testing Laboratory may provide the services of the Testing Agency.

BB. Trench: A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet.

CC. Unsatisfactory Material: Soil material that contains organic silt, peat, vegetation, wood or roots, stones or rock fragments over six (6) inches in diameter or exceeding 40 percent by weight of the backfill material, porous biodegradable matter, loose or soft fill, construction debris, or refuse, or material which cannot be compacted to the specified or indicated density.

1.6 SUBMITTALS

A. Testing Laboratory - Submit name and qualifications of commercial testing laboratory for Engineer’s approval. Submit applicable documentation of credentials, licenses, etc.

B. Testing Agency - Submit name and qualifications of third-party in-field quality control Testing Agency for Engineer’s approval. Submit applicable documentation of credentials, licenses, etc.

C. Site Characterization of Off-Site Borrow Sources: The following information shall be submitted to Engineer for review at least two weeks prior to use of an off-site borrow source:

1. Location and name of the borrow source site.

2. Owner and contact information for the borrow source site.

3. Present and past usage of the source site and materials.

4. Any previously existing report(s) associated with an assessment of the source site as relates to the presence of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.

5. Location within the site from which the material will be obtained.

D. Chemical Testing Data: For each type/classification of earth material proposed and each source of earth material proposed: Submit a letter signed by an authorized representative of material supplier stating that such proposed material is free of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.

E. Material Testing Data: Provide results for all proposed bedding, fill, aggregates, and backfill. Submit complete laboratory reports.

1. Gradation analysis.

2. Soil classification and Moisture-Dry Density Curve.

3. Loss on Abrasion.

4. Soundness.

F. Samples: Five (5) gallon pail sample of each type of off-site bedding, fill, aggregates, and backfill that are proposed for use at the Project Site in an air-tight container for the testing laboratory, a minimum of two weeks prior to delivery of such material to the site. Use of these proposed materials by Contractor prior to testing and approval or rejection shall be at Contractor's risk.

G. Product Data

1. Plastic warning tape.

2. Separation fabric, filter fabric, geogrids, or similar geotextiles.

H. Field Testing Results

1. Compaction test results keyed to date and specific location of testing. Provide Engineer with copies of testing reports within 24 hours of field test.

1.7 SAFETY

A. Contractor shall conduct all excavation activities in conformance with applicable regulations, including those relating to warning signs, excavation safety, sheeting, shoring, and stabilization.

B. Contractor shall provide and maintain barricades, signs, lights, etc., required for the protection of personnel, materials and property. Temporary barricades, etc. shall conform all applicable codes and regulations, and shall be lighted at night with lanterns, flares and reflectorized paint as required for safety. Adapt barricades, signs, lights, etc. to evolving site conditions throughout the progress of the work.

C. Provide other safety devices as required, including adaptation of such safety devices to changing site conditions, to prevent unauthorized entry to construction areas and open excavations. Provide warning signs and other temporary construction safety devices necessary for proper completion of the work in compliance with applicable safety regulations.

D. Contractor shall properly design and furnish all labor, materials, equipment, and tools necessary to construct permanent or temporary excavation support systems, including, but not necessarily limited to, sheet piling, trench shields, trench boxes, timber trench shoring, pneumatic/hydraulic shoring, steel sheeting or sheeting using other materials, sloping, and benching.

E. Any time an excavation is to remain open, at a minimum, provide full enclosure with safety barriers and fencing, warning signs, and additional safety control measures as appropriate for the condition.

1.8 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required

for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.

B. Utility Mark-out

1. Prior to commencing work, comply with utility mark-out requirements of the Call-Before-You-Dig System (1-800-922-4455).

2. Verify the location of all subsurface utilities marked through the Call-Before-You-Dig System.

3. Not all subsurface facilities or structures will be identified through the Call-Before-You-Dig System. Confirm the location of other subsurface utilities and other subsurface facilities or structures prior to commencing work. Field-mark utilities as required.

C. Codes and Standards: Perform the work of this Section in accordance with all applicable codes, standards, and the requirements of authorities having jurisdiction.

D. Engineer reserves the right to perform all in-field testing specified in this Section and reserves the right to determine the suitability of all materials to be used for fills and reject any fill not meeting the specifications.

E. Field Density testing and subgrade observation shall be performed by the designated entity

F. Weather Limitations:

1. Material excavated when frozen or when air temperature is less than 32 degrees Fahrenheit (32 F) shall not be used as fill or backfill until material completely thaws.

2. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

G. Vibration

1. Vibration producing activities such as operation of heavy construction equipment, vibratory compaction, etc. may be required. Contractor is advised that structures are located close to the proposed work and that construction activities shall be conducted so as to preclude damage to these structures and undue annoyance to occupants.

2. Contractor has liability for, and shall bear all costs associated with, any damage caused to existing structures, buildings and/or services as a result of any construction activity. This extends to responding to any claims of vibration-induced damage. It is Contractor's sole decision how to manage the risk of vibration-induced damage, and what, if any, surveys, monitoring, or other activities are undertaken.

1.9 TESTING

A. All sampling and testing shall be the responsibility of Contractor via Testing Agency and Testing Laboratory as applicable. Contractor shall retain and pay for the services of such Testing Agency/Testing Laboratory to perform all pre-construction testing and field testing in accordance with applicable standards.

B. Borrow and Fill: Contractor shall provide testing as defined below.

1. Gradation analysis for each type of borrow and on-site fill materials by ASTM D422.

2. Soil classification (ASTM D2487) and Moisture-Dry Density Curve (Proctor Test-Modified) by ASTM D1557 for all proposed fill and backfill materials at the frequency specified below:

    a. For suitable soil materials removed during Trench Excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.

    b. For borrow materials, perform tests from each proposed source, at a rate of one test for every 1,000 cubic yards of soil type. Similarity of soil types will be as determined by the Engineer.

3. Loss on Abrasion: Where called-for, AASHTO Method T 96.

4. Soundness: Where called-for, AASHTO Method T 104.

C. Compaction Testing: Contractor shall conduct compaction testing (i.e. ASTM D2922 and ASTM D3017 or ASTM D1556) at the frequency indicated below.

1. Trench: 1 test per lift, every 1,000 square feet or 200 feet of trench.

2. Embankment: 1 test per lift, every 1,000 square feet.

3. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.

4. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than 95% of maximum dry density at optimum moisture content, Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.

5. Contractor is cautioned that compaction testing by nuclear methods may not be effective where trenches are so narrow that trench walls impact the attenuation of the gamma radiation or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.

6. If testing indicates that compacted subgrade, backfill, or fill are below specified density, additional compaction and/or replacement of material shall be provided at no expense to Owner.

D. Chemical Testing: Prior to delivery of any earth material to the Project Site, Contractor shall conduct chemical testing to demonstrate that such material is free of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.

1.10 EXCAVATED MATERIAL

A. Placement

1. Excavated material shall be so placed as not to interfere with travel or movement on existing streets, driveways, sidewalks or other areas designated to remain undisturbed.

Excavated material shall not be deposited on private property without the written consent of the property owner(s) and approval of Engineer.

2. No excavated material shall be stored on top of installed pipe, other subsurface construction, or within the drip-line of trees.

3. Contractor shall consider surcharge loads when stockpiling excavated material adjacent to excavations, and take any measure required to prevent cave-in, including but not limited to, excavation support systems and/or alternative stockpiling locations.

B. Satisfactory Material excavated at the Project Site may be used for Common Fill or Backfill on other parts of the Work, if specifically approved by Engineer. Engineer or Geotechnical Engineer shall determine what is Satisfactory Material or Unsatisfactory Material where questions arise.

C. Contractor shall be responsible for the proper disposal of all Unsatisfactory Material. Engineer or Geotechnical Engineer shall determine what is Satisfactory Material or Unsatisfactory Material where questions arise.

1.11 SHEETING, SHORING AND BRACING

A. Provide earth retention systems as required by federal, state and local regulations. Shoring and bracing of trenches and other excavations shall be in accordance with the latest OSHA Standards and interpretations, and all other applicable codes, rules and regulations of federal, state and local authorities.

1.12 DRAINAGE

A. At all times during construction, Contractor shall temporarily provide, place and maintain ample means and devices with which to remove promptly, and dispose of properly, all water entering trenches and other excavations, or water that may flow along or across the site of the Work, and keep said excavations dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be damaged. At the conclusion of the work, Contractor shall remove such temporary means and devices.

B. All groundwater which may be found in the trenches and foundation excavations, and any water which may get into them from any cause whatsoever, shall be pumped or bailed out, so that the trench shall be dry during pipe laying and backfilling and during the placement of concrete.

C. All water pumped or drained from the Work shall be managed in accordance with applicable discharge permits, without undue interference with other work or damage to pavements, other surfaces, or property.

1.13 COORDINATION

A. Prior to commencing earthwork operations, meet with representatives of governing authorities, Engineer, testing entity, and other pertinent entities.

1. Review earthwork procedures and responsibilities including Contractor's schedule of operations, scheduling observation and testing procedures and requirements.

2. Notify participants at least three (3) working days prior to convening conference. Record discussions and agreements and furnish copies to each participant.

3. Contractor shall at all times so conduct his work as to insure the least possible inconvenience to the general public and the residents in the vicinity of the work. Fire hydrants on or adjacent to the work shall be kept accessible to firefighting equipment at all times. Temporary provisions shall be made by Contractor to ensure the proper functioning of all gutters, sewer inlets, and drainage ditches, which shall not be obstructed except as approved by Engineer.

B. Benchmark/Monument Protection: Protect and maintain benchmarks, monuments or other established reference points and property corners. If disturbed or destroyed, replace at no cost to Owner.

C. Provide five (5) days advance notice to Engineer and testing entity for any proposed earthwork operation requiring observation and/or testing.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. All materials used in the work of this Section shall be Satisfactory Material, and any material that does not meet this classification shall be considered an Unsatisfactory Material and shall not be used.

B. Unsatisfactory Soils: Soil materials not meeting the requirements for Satisfactory Soils.

1. Unsatisfactory soils also include satisfactory soils not maintained within two (2) percent of optimum moisture content at time of compaction.

2.2 COMMON FILL/ORDINARY BORROW

A. Earth materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GP-GC, SW, SP, and SM that are free of clay and with less than twenty (20) percent of material by weight passing the No. 4 sieve that passes the No. 200 sieve.

B. Common Fill material is subject to the approval of Engineer and may be either material removed from excavations or borrow from off site. It shall have physical properties such that it can be readily spread and after it has been placed and properly compacted, it will form a dense, stable fill.

C. Common Fill shall not be used at locations where use of a specific earth material is called-for.

2.3 BANK RUN GRAVEL

A. Granular material, well graded from fine to coarse, obtained from approved natural deposits and unprocessed, except for the removal of unacceptable material and stones larger than the maximum size permitted.

B. Bank Run Gravel shall be graded as follows:

Gradation of Bank Run Gravel (ConnDOT Grading “C”)

Sieve	Percent Passing by Weight
1 ½”	100
¾”	45-80

¼	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

2.4 GRANULAR FILL

A. Broken or crushed stone, gravel, or a mixture thereof.

B. Broken or crushed stone

1. The product resulting from the artificial crushing of rocks, boulders or large cobblestones, substantially all faces of which have resulted from the crushing operation. Broken or crushed stone shall consist of sound, tough, durable stone, reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces.

C. Bank or crushed gravel

1. Sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. Crushed gravel shall be the manufactured product resulting from the deliberate mechanical crushing of gravel with at least 50% of the gravel retained on the No. 4 sieve having at least one fractured face.

D. Granular Fill shall be graded as follows:

Gradation of Granular Fill (ConnDOT Grading "A")

Sieve	Percent Passing by Weight
3 ½"	100
1 ½"	55-100
1/4"	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

E. Reclaimed material shall not be considered acceptable for use as granular fill.

2.5 SCREENED GRAVEL AND CRUSHED STONE

A. Screened gravel, well graded in size from 3/8 inch to 3/4 inch. The gravel shall consist of clean, hard, and durable particles or fragments. Crushed rock of suitable size and grading may be used instead of screened gravel.

B. Screened Gravel shall be graded as follows:

Gradation of Screened Gravel (ConnDOT Gradation No. 6)

Sieve	Percent Passing by Weight

1”	100
3/4”	90-100
1/2”	20-55
3/8”	0-15
No. 4	0-5

2.6 SUBBASE

A. Bank or Crushed Gravel

1. Sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin, elongated or laminated pieces. It shall be hard and durable enough to resist weathering, traffic abrasion and crushing.

2. Bank or crushed gravel for subbase shall be graded as follows:

Gradation of Bank or Crushed Gravel Subbase (ConnDOT Gradation “B”)

Sieve	Percent Passing by Weight
5”	100
3 1/2”	90-100
1 1/2”	55-95
1/4”	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

B. Crusher-Run Stone

1. Sound, tough, durable broken stone. It shall be reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces.

2. Loss on Abrasion: The crusher-run stone shall show a loss on abrasion of not more than fifty percent using AASHTO Method T 96.

3. Crusher-run stone shall for subbase shall be graded as follows:

Gradation of Crusher Run Stone Subbase (ConnDOT Gradation “A”)

Sieve	Percent Passing by Weight
3 1/2”	100
1 1/2”	55-100
1/4”	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

2.7 PROCESSED AGGREGATE BASE

A. Coarse aggregates and fine aggregates shall be combined and mixed by approved methods so that the resulting material shall conform to the following gradation:

Gradation of Processed Aggregate Base

Sieve	Percent Passing by Weight
2 1/2”	100
2”	95-100
3/4”	50-75
1/4”	25-45
No. 40	5-20
No. 100	2-12

B. Coarse Aggregate: Either gravel, broken stone or a combination thereof. When tested by means of the Los Angeles Machine, using AASHTO Method T 96, the coarse aggregate shall not have a loss of more than 50%.

1. If gravel is used for the coarse aggregate, it shall consist of sound, tough, durable particles of crushed or uncrushed gravel or a mixture thereof, free from soft, thin, elongated or laminated pieces, lumps of clay, loam and vegetable or other deleterious substances.

2. If broken stone is used for the coarse aggregate, it shall consist of sound, tough, durable fragments of rock of uniform quality throughout. It shall be free from soft disintegrated pieces, mud, dirt, organic or other injurious material.

3. Soundness for Gravel and Broken Stone: When tested by magnesium sulfate solution for soundness using AASHTO Method T 104, the coarse aggregate shall show a loss of not more than 15% at the end of 5 cycles.

C. Fine Aggregate: Natural sand, stone sand, screenings or any combination thereof. The fine aggregate shall be limited to material 95% of which passes a No. 4 (4.75-mm) sieve having square openings and not more than 8% of which passes a No. 200 (75-μm) sieve. The material shall be free from clay, loam and deleterious materials.

1. Plasticity: When natural sand is used, the fine aggregate shall conform to the following:

a. When the fraction of the dry sample passing the No. 100 mesh sieve is 4% or less by weight (mass), no plastic limit test will be made.

b. When the fraction of the dry sample passing the No. 100 mesh sieve is greater than 4% and not greater than 8% by weight (mass), that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.

c. When the fraction of the dry sample passing the No. 100 mesh sieve is greater than 8% by weight (mass), the sample will be washed; and the additional material passing the No. 100 mesh sieve shall be determined by AASHTO Method T 146, except that the No. 100 mesh sieve will be substituted for the No. 40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that passed the No. 100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.

2. Plasticity: When screenings or any combination of screenings and natural sand or any combination of stone sand and natural sand are used, the following requirements shall apply:

   a. When the fraction of the dry sample passing the No. 100 mesh sieve is 6% or less by weight (mass), no plastic limit test will be made.

   b. When the fraction of the dry sample passing the No. 100 mesh sieve is greater than 6% and not greater than 10% by mass, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test, using AASHTO Method T 90.

   c. When the fraction of the dry sample passing the No. 100 mesh sieve is greater than 10% by weight (mass), the sample shall be washed; and additional material passing the No. 100 mesh sieve shall be determined by AASHTO Method T 146, except that the No. 100 mesh sieve shall be substituted for the No. 40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that have passed the No. 100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.

2.8 BEDDING

A. Utilities- Refer to applicable utility Specifications.

2.9 SAND

A. Sand shall consist of clean, hard, durable, uncoated particles of quartz or other rock. It shall not contain more than 3% of material finer than a #200 sieve.

B. Organic Impurities: Fine aggregate subjected to the colorimetric test shall not produce a color darker than Gardner Color Standard No. 11, using AASHTO T 21. If the fine aggregate fails to meet this requirement, the provisions of AASHTO M 6, Section 5.2, will govern.

C. Sand shall be uniformly graded as follows:

Gradation of Sand

Sieve	Percent Passing by Weight
3/8”	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10

D. The above gradation represents the extreme limits which shall determine suitability for use from all sources of supply. The gradation from any one source shall be reasonably uniform and not subject to the extreme percentages of gradation specified above. For the purpose of determining the degree of uniformity, a fineness modulus determination will be made upon representative samples from any source. Fine aggregate from any one source having a variation in fineness

modulus greater than 0.20 either way from the fineness modulus of the representative sample will be rejected.

2.10 FLOWABLE CONCRETE FILL/BACKFILL (FLOWFILL)

A. Cementitious material, ACI 229R, comprised of cement, aggregates, fly ash, water, and admixtures, capable of being poured or pumped, self-leveling, self-curing to specified strengths.

B. Excavatable flowfill: Concrete strength shall be liquid enough to flow, be self-leveling and excavatable by hand methods. Unless otherwise specified, excavatable flowfill shall have a minimum 28 day compressive strength of 30 psi, and shall not exceed 100 psi.

C. Non-excavatable flowable: Concrete strength shall be liquid enough to flow and be self-leveling and excavatable by machine equipment. Unless otherwise specified, non-excavatable flowfill shall have a minimum 28-day compressive strength of 125 psi, and shall not exceed 200 psi.

2.11 DETECTABLE WARNING TAPE

A. Acid and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric power lines, electric power conduits and other electric power facilities.

2. Yellow: Gas, oil petroleum products, steam, compressed air, compressed gas and all other hazardous materials.

3. Blue: Water.

4. Orange: Communication lines or cables, including but not limited to telephone, fire signals, cable television, and electronic controls.

5. Green: Storm drainage and sanitary sewer systems, including force mains and other non-hazardous materials.

6. Brown: Chilled Water and Other.

PART 3 EXECUTION

3.1 PREPARATION

A. Notify “Call-Before-You-Dig” to request a utility mark-out for the Project Site prior to any earth disturbance. Provide written confirmation to Engineer that such mark-out has been completed.

B. Verify site conditions before proceeding with demolition work. Field check the accuracy of the Drawings and inspect structures, utilities, and other site features prior to start of work and notify Engineer in writing, of any discrepancies or hazardous conditions.

C. Take precautions for preventing injuries to persons or damage to property in or about the work. Protect structures, utilities, sidewalks, pavements and other improvements from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

D. Protect sub-grades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

E. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

F. When excavations are to be made in paved surfaces, the pavement shall be removed so as to provide a clean uniform edge with a minimum disturbance of remaining pavement. Saw cutting the pavement to provide a clean, uniform edge shall unless otherwise indicated.

G. If pavement is removed in large pieces, it shall not be mixed with other excavated material, but shall be disposed of away from the site of the Work before the remainder of the excavation is made.

3.2 CLEARING AND GRUBBING

A. Clear, grub, remove, and dispose of all vegetation and debris within the limits of construction, as designated on the plans or as required by Engineer. Contractor shall remove only those trees and shrubs absolutely necessary to allow for the construction. The work shall also include the preservation from injury of defacement of all vegetation or object designated to remain.

3.3 PROTECTION OF EXISTING FEATURES

A. General

1. Protect all existing improvements from damage unless those improvements are specifically designated for permeant removal, relocation, or temporary removal and replacement.

2. As excavation approaches underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools.

3. Pavements: On paved surfaces to remain, do not use or operate tractors, bulldozers, or other power operated equipment, the treads or wheels of which are so shaped as to cut or otherwise damage such surfaces. All surfaces, which have been damaged by Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. Suitable materials and methods shall be used for such restoration.

B. Utilities

1. Existing utilities remaining in service, including those remaining in service until after relocation, and relocated utilities shall be protected from damage. Before excavating near any existing utilities, notify the utility owner, coordinate protective work and comply with the utility owners' requirements. Coordinate with respective utility owners/operators as required.

2. Safeguard and protect from damage or movement any existing services, utilities, and utility structures uncovered or encountered which are to remain in service.

3. All utility services shall be supported by suitable means so that the services shall not fail when tamping and settling occurs.

4. Where known utilities are encountered, notify Engineer and document location and type of utility before proceeding with work in such area.

5. When uncharted or incorrectly charted piping or utilities are encountered during excavation, stop work and notify Engineer immediately. Cooperate with the utility owners in maintaining their utilities in operation prior to resuming work.

C. Retaining Structures: Provide bracing, shoring, sheeting, sheet piling, underpinning or other retaining structures necessary to guard against any movement or settlement of existing or new construction, utility systems, paving, or other improvements. Assume responsibility for the strength and adequacy of retaining structures, and for the safety and support of construction, utilities or paving, and for any movement, settlement or damage thereto. Retain the services of a licensed engineer as required to design bracing, shoring, sheeting, sheet piling, underpinning or other retaining structures.

D. Replacement and Relocation

1. In case of damage, Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. When the Owner does not wish to make the repairs themselves, all damage shall be repaired by Contractor, or, if not promptly done by him, Engineer may have the repairs made at the expense of Contractor.

2. If certain existing structures are encountered that in the opinion of Engineer require temporary or permanent relocation or removal, Engineer may order in writing that Contractor undertake all or part of such work or to assist the Owner in performing such work. For such occurrences, Contractor shall be compensated as applicable, as extra work.

3. In removing existing structures, Contractor shall use care to avoid damage to the material, and Engineer shall include for payment only those new materials, which, in his judgment, are necessary to replace those unavoidably damaged.

4. The structures to which the provisions of the preceding two paragraphs shall apply include structures which (1) are not indicated on the Drawings or otherwise provided for, (2) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (3) in the opinion of Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced. (See Item 3.19, "Sub Surface Obstructions" also).

3.4 DEWATERING

A. Comply with all applicable permit requirements.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrade and from flooding Project site and surrounding area.

C. Protect sub-grades from softening, undermining, washout and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

2. Install de-watering system to keep subgrades dry and convey ground water away from excavations.

3.5 EXCAVATION

A. Dust Control: During the progress of the Work, Contractor shall conduct his operations and maintain the area of his activities in order to minimize the creation and dispersion of dust. Refer to Section 01 5714- Temporary Dust Control.

B. Excavate to the exact elevations shown on the plans, or as directed by Engineer. Where no dimensions are indicated, make excavations in such manner, and to such depths, elevations, and dimensions, that will give suitable room for construction of the work indicated on the Drawings. As applicable for utility installations, comply with trench limits shown on the Drawings.

C. Furnish and place all sheeting, bracing, and supports, and render the bottom of the excavation firm and dry, and in all respects, acceptable for construction of the work.

D. If Contractor excavates below the elevations specified on the plans, beyond the limits indicated on the plans, or where no dimensions are indicated, beyond depths, elevations, and dimensions reasonably necessary for construction of the work, Contractor shall bring the excavation back to the proper elevation and/or dimension by backfilling with Suitable Material that is approved by Engineer in accordance with the backfilling provisions specified herein. Engineer, or if applicable Geotechnical Engineer, shall have sole authority in determining the specific composition of such Suitable Material.

   1. Any increase in cost resulting from Unauthorized Excavation, including but not necessarily limited to backfilling, haul-off, increasing the size of footings or foundations, testing, schedule impact, or administrative impact shall be at Contractor's sole expense.

E. If utilities are to be laid in new embankments, or other new fill areas which are more than 12 inches deep below the invert of the pipe, the fill material shall be placed and properly compacted to final grade or to a height of at least 3 feet above the top elevation of the pipe, whichever is the lesser, before laying pipe. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall then be excavated as though in undisturbed material.

3.6 TRENCH EXCAVATION

A. In general, trenches shall be excavated to such depth as will provide a cover depth as indicated on the Drawings from finished grade to the top of the pipe barrel. Deeper trenches shall be provided where necessary on account of the conformation of the ground and to permit the alignment of the pipe without undue deflection of joints.

B. Trenches shall be excavated by hand or machinery to the width and depth indicated on the Drawings and specified herein. Depth shall account for thickness of the pipe and thickness of bedding. All loose materials shall be removed from the bottom of the trench so that the bottom of the trench will be in an undisturbed condition.

C. If in the opinion of Engineer, the material at or below the depth to which excavation for structures and pipes would normally be carried is unsuitable for foundation, it shall be removed to such widths and depths as directed and replaced with suitable material.

D. Trench widths shall be 3 feet greater than the nominal inside diameter of pipe for such diameters of 36 inches or less. For diameters greater than 36 inches, the width shall be 4 feet greater than nominal inside diameter. Trench excavation for manholes, catch basins, drop inlets, etc. shall be two (2) feet outside the neat lines of the foundations. These limits may be adjusted for field conditions at the direction of Engineer.

E. Bedding for pipe and utility structures will be as detailed on the Drawings.

3.7 APPROVAL OF SUBGRADE

A. Notify Engineer, and Geotechnical Engineer if applicable, when excavations have reached required subgrade elevation.

B. If Engineer and, if applicable, Geotechnical Engineer determines that Unacceptable Material is present, continue excavation of such Unacceptable Material and replace with approved Satisfactory Materials as directed. The replacement of Unacceptable Material with Satisfactory Materials will be paid for as a change in the work according to applicable provisions of the contract.

C. Protect subgrade from disturbance at all times. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water or construction activities, as directed by Engineer. Excavation and replacement with structural fill of any disturbed or softened materials resulting from inadequate preparation, inadequate dewatering, or inadequate protection, shall be at Contractor's sole expense.

3.8 TUNNELING

A. In general, excavation shall be made in open cut from the surface and Contractor shall not be allowed to do any tunneling without obtaining permission from Engineer, and then only according to methods approved by him, and at no additional cost to the Owner. This permission will only be given where a line is to be laid to a point behind the curb, across a paved street, or where, in the opinion of the Engineer, it is necessary to tunnel short sections on account of proximity of adjacent walls, utilities, structures, to avoid important roots of trees or large masses of roots, or to ensure against root damage endangering the life of trees near the pipeline location. Such excavations then can be made in alternate sections of open cut and tunnel, the length of the tunnel sections to be specified by Engineer. These tunnel sections shall be cut underneath to a wedge with its edge horizontally across the pipe, and backfilled tightly by ramming and tamping from each end.

3.9 FILL AND BACKFILL

A. Fill: Contractor shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas upon which embankments will be built or material will be placed as fill to adjust subgrade prior to final grading. The subgrade shall be prepared by forking, furrowing, or plowing such that the first layer of the new material placed thereon, will be well bonded to it.

B. Backfill: Common Fill material may be used as backfill when indicated on the Drawings or when authorized by Engineer (or as applicable Geotechnical Engineer) if Contractor can achieve required minimum dry density after compaction. Backfilling shall be done as promptly as is consistent with non-injury to pipe or structures, but no backfilling shall be done before Engineer (or as applicable Geotechnical Engineer) gives permission.

C. Frozen material shall not be placed in any fill or backfill, nor shall any fill or backfill be placed upon frozen material. Previously frozen material shall be removed, or shall be otherwise treated as required, before new fill or backfill is placed.

D. After the subgrade has been prepared, fill material shall be placed thereon and built up in successive layers not exceeding twelve (12) inches before compaction until it has reached the required elevation.

1. When gravel fill or other material is used for foundation of structures, it shall be spread in layers of uniform thickness not exceeding six (6) inches before compaction.

E. Upon completion of filling and backfilling, all surplus material shall be removed and surfaces to remain which are affected in any way by the work restored to the condition in which they were before ground was broken. All surplus materials shall become the property of Contractor. If Contractor fails to promptly remove such surplus materials, Engineer may have the same done and charge all associated costs to Contractor, including deduction from payments due.

3.10 BACKFILLING UTILITIES

A. As soon as practical after utility has been placed into bedding and joints properly made, backfilling shall begin, and shall continue without delay.

B. Placement of bedding over pipe prior to placement of backfill shall be as indicated on the Drawings. Hand-place bedding at the sides of the pipe and to the limits indicated on the Drawings over the pipe. Bedding placed over pipe shall be in 6-inch layers, leveled along the length and width of the trench and thoroughly compacted with approved tampers.

C. Install warning tape as indicated o the Drawings unless otherwise specified by the utility owner/operator.

3.11 BACKFILLING AT STRUCTURES

A. No backfill shall be deposited against concrete until the concrete has obtained sufficient strength to withstand the earth pressure placed upon it and in no case less than seven days, nor before carrying out and satisfactorily completing the tests for watertight structures specified elsewhere.

B. Prior to placing backfill, subgrade shall be thoroughly compacted. Soft or loose material evident during compaction shall be removed and replaced with Granular Fill.

C. Fill placed around arches, rigid frames, box culverts and piers shall be deposited on both sides of the structure to approximately the same elevation at the same time. Each layer of backfill shall be spread to a thickness not exceeding 6 inches deep after compaction and shall be thoroughly compacted by the use of power rollers or other motorized vehicular equipment, by tamping with mechanical rammers or vibrators, or by pneumatic tampers. Any equipment not principally manufactured for compaction purposes or which is not in proper working order in all respects shall not be used within the area described above.

D. Bring backfill to sub-grade elevations. Slope backfill at exterior of building to drain water away from building.

3.12 COMPACTION

A. Each layer of fill or backfill material shall be compacted by the use of compaction equipment consisting of rollers, compactors or a combination thereof. Earth-moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment. At such points as cannot be reached by mobile mechanical equipment, or where such equipment is not permitted, the materials shall be thoroughly compacted by the use of suitable power- driven tampers.

B. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from

either rain or application of water, to compact it properly. At such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.

C. Special attention shall be given to compaction in places close to walls where motorized vehicular compaction equipment cannot reach. Within 3 feet of the back face of walls and within a greater distance at angle points of walls, each layer of backfill shall be compacted by mechanical rammers, vibrators or pneumatic tampers.

D. Each layer of fill or backfill shall be compacted at optimum moisture content. No subsequent layer shall be placed until the specified compaction is obtained for the previous layer.

E. Compaction Density: Compaction density shall be expressed as a percentage of maximum dry density at optimum moisture content according to ASTM D 1557 Method C. Density indicated is minimum required.

1. Under structures, building slabs, and steps: 95 %

2. At building foundations: 95 %

3. Utilities, below pipe centerline: 95%

4. Utilities below unpaved surface, above pipe centerline: 92%

5. Utilities below paved surface, above pipe centerline: 95%

6. Embankments: 92%

7. Landscaped areas: 90 %.

8. Natural grass athletic fields and similar recreational fields: 93%

3.13 SUBSURFACE OBSTRUCTIONS

A. As a general rule, sub-surface obstructions encountered along the route of the pipeline shall be considered as follows:

1. Crossing Obstruction: All pipes, conduits, wires, etc. of whatever nature whose centerline lies at an angle of 20 degrees or greater to the centerline of the pipe being installed shall be considered as crossing obstructions and shall be protected, or repaired or replaced if damaged, or relocated, all at no additional cost to the Owner.

2. Interfering Obstructions: All pipes, conduits, wires, etc. of whatever nature whose centerline lies at an angle of less than 20 degrees, but more than 5 degrees to the centerline of the pipe being installed, shall be considered as interfering obstructions. Costs for supporting such obstructions in place during installation of the new pipe shall be paid for by the Owner. Costs for supporting interfering obstructions shall not be construed to include any costs for excavation. Repairing or replacing damaged interfering obstructions, or relocation shall be accomplished at no additional cost to the Owner.

3. Parallel Obstructions: All pipes, conduits, wires, etc. of whatever nature whose centerline lies at an angle of 5 degrees or less, or is truly parallel and less than 0.5 feet offset from outside the normal trench limits, as specified in Subarticle 3.5 B. of this Section, of the

pipe being installed, shall be considered parallel obstructions. Costs for supporting such obstructions in place during installation of the new pipe, including excavation, may be paid for by the Owner, or Owner may elect to pay for the cost of replacing such obstructions. Should Owner first elect to pay the cost of supporting the obstruction and then elect to pay the cost of replacing the obstruction, approved costs for supporting the obstruction, including excavation, incurred prior to electing replacement costs shall also be paid. After Owner elects to pay replacement costs, only replacement costs will be paid for all additional work in the vicinity of the parallel obstruction.

4. Angle measurement between centerline of obstructing pipe, conduit, wire, etc. and centerline of the pipe being installed shall be taken from between the horizontal projection of the centerlines at ground surface. Parallel offset distance between centerline of obstructing pipe, conduit, wire, etc. and the outside of normal trench limits of the pipe being installed shall be taken from between the horizontal projection of the centerlines and outside trench limit at ground surface.

END OF SECTION

SECTION 32 1217

BITUMINOUS CONCRETE SIDEWALK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Bituminous concrete surfaced sidewalk or driveway constructed on a gravel or reclaimed miscellaneous aggregate base course in the locations and to the dimensions and details shown on the plans or as directed by Engineer and in accordance with these specifications.

B. Work shall also include all associated items and operations necessary and required to complete the installations, including, but not limited to, surface preparation, finishing and cleanup.

C. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

D. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. United States Code of Federal Regulations (CFR)

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. State of Connecticut Department of Transportation (ConnDOT)

1. Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016 and any supplements.

1.3 SUBMITTALS

A. Design Mix: Before any paving is constructed, submit actual design mix to the Engineer for review and approval. Design mix submittal shall follow the format indicated in the Asphalt Institute Manual MS-2, Marshall Stability Method; and shall include the type/name of the mix, gradation analysis, grade of asphalt cement used, Marshall Stability (lbs.), flow, and effective asphalt content (percent).

B. Material Certificates: Submit materials certificate signed by the material producer and Contractor, to the independent testing laboratory certifying that materials comply with, or exceed, the requirements herein.

PART 2 PRODUCTS

2.1 BASE COURSE

A. See Specification Section 31 2310 – Earthwork, Granular Fill

2.2 LIQUID BITUMINOUS MATERIALS

A. Performance grade (PG) binder.

1. Material shall have uniformly mixed and blended liquid bituminous materials that are free of contaminants such as fuel oils and other solvents. Such materials shall be properly heated and stored to prevent damage or separation. PG binders used in the production of bituminous materials shall be approved by Engineer. PG binders that are modified with fillers, extenders, reinforcing agents, adhesion promoters, additives, and thermoplastic polymers shall be approved for use only with the prior written approval from Engineer.

2. Basis of Acceptance: The request for approval of the source of supply shall list the location where the materials will be produced, and manufacturing, processing, handling and storage methods along with necessary certification in accordance with AASHTO R-26. The PG binder utilized for the production of bituminous materials shall consist of the grade specified in the Contract when tested in accordance with AASHTO M-320 and AASHTO R-29.

B. Emulsions

1. Emulsified asphalt shall be homogeneous and not be used if exposed to freezing temperatures.

2. Basis of Acceptance: The request for approval of the source of supply must include the location where the materials will be produced, and manufacturing, processing, handling and storage methods.

a. Emulsified asphalts shall conform to the requirements of AASHTO M-140. Materials used for tack coat shall be grade RS-1. When ambient temperatures are 80˚F (27˚C) and rising, grade SS-1 or SS-lh may be substituted if approved by Engineer.

b. Cationic emulsified asphalt shall conform to the requirements of AASHTO M-208. Materials used for tack coat shall be grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the DRM. When ambient temperatures are 80˚F (27˚C) and rising, grade CSS-1 or CSS-lh may be substituted if approved by Engineer.

2.3 BITUMINOUS CONCRETE SURFACE

A. ConnDOT “HMA 0.375” ConnDOT Form 817.

PART 3 EXECUTION

3.1 GENERAL

A. Contractor shall install all pavements as specified in the location and to the grades as shown on the Drawings and/or approved by Engineer. Materials, methods of construction, and type and thickness of pavement courses shall be as shown on the Details of the Drawings and as specified herein.

3.2 BASE COURSE

A. See Specification Section 31 2310 – Earthwork.

3.3 PREPARATION FOR PAVEMENT INSTALLATION

A. Remove loose material from compacted base material surface immediately before proofrolling.

B. Proof roll prepared base material surface to check for areas requiring additional compaction and areas requiring removal and recompaction.

C. Do not begin paving work until deficient base material areas have been corrected and are ready to receive paving.

D. Check all frames, covers, grates, water valve boxes and other miscellaneous castings that are located in the proposed pavement areas to insure that all such items have been correctly positioned and set to the proper slope and elevation. All covers and grates are to be set flush with the required finished surface. No depressions or mounds will be permitted in the pavement to accommodate inaccuracies in the setting of these appurtenances. All correctional work that may be necessary, as determined by Engineer, shall be performed at the Contractor's expense.

E. All vertical surfaces of structures and existing concrete surfaces in contact with new bituminous pavement shall be painted with a uniform coating of an approved bituminous emulsion material. Extreme care shall be exercised in the application of this material to prevent splattering or staining of surfaces that are to be exposed after the Work is completed. Surfaces that are stained as a result of the Contractor's operation shall be repaired and/or replaced to the satisfaction of Engineer at Contractor's expense.

3.4 TRANSPORT

A. Mixture shall be transported from the mixing plant in trucks that have previously been cleaned of all foreign material and that have no gaps through which material might inadvertently escape. The use of kerosene, gasoline, fuel oil, or similar products for the coating of the inside of truck bodies is prohibited. Truck body coating and cleansing agents must not have a deleterious effect on the transported materials. If such agents are applied, truck bodies shall be raised immediately prior to loading to remove any excess agent.

B. Loaded trucks shall be tightly covered with waterproof covers acceptable to the Engineer. Mesh covers are prohibited. The front and rear of the cover must be fastened to minimize air infiltration.

C. Do not exceed legal weight limits.

3.5 APPLICATION

A. Tack Coat

1. Apply to contact surfaces of all portland cement concrete surfaces and surfaces abutting or projecting into bituminous concrete pavement.

2. Apply tack coat to existing bituminous concrete surfaces at match points and where indicated on the drawings.

3. Apply at a minimum rate of 0.05 gallons per square yard of surface.

4. Allow to dry until at proper condition to receive paving.

3.6 PLACING AND COMPACTING

A. Prior to the placement of the bituminous concrete, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance. Immediately before placing the mixture, the area to be surfaced shall be cleaned by brooming or by other means acceptable to the Engineer. Place bituminous concrete mixture on completed, compacted base surface, spread, and strike off.

B. Whenever possible, all pavement shall be spread by a self-propelled finishing machine. At inaccessible or irregular areas, pavement may be placed by hand methods. If hand methods are used, the hot mixture shall be spread uniformly to the required depth with hot shovels and rakes. After spreading, the hot mixture shall be carefully smoothed to remove all segregated coarse aggregate and rake marks. Rakes and lutes used for hand spreading shall be of the type designed for this use. Material loads shall not be dumped faster that they can be properly spread. Workers shall not stand on the loose mixture while spreading.

C. When the bituminous concrete is spread by hand, forms shall be used.

1. Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist springing from the impact of the roller. If made of wood, they shall be of 2-inch surfaced plank except that at sharp curves thinner material may be used; if made of metal, they shall be of an approved section.

2. All forms shall be of a depth equal to the depth of the sidewalk and shall be securely staked, braced, and held firmly to the required line and grade.

3. All forms shall be cleaned and oiled each time they are used.

D. The mixture shall be placed at a temperature that is within 25ºF of the approved job mix formula.

E. Joints: Make joints between old and new pavements, and between successive days' work, to ensure continuous bond between adjoining work. Construction joints shall have same texture, density, and smoothness as other sections of paving. Clean contact surfaces and apply tack coat.

F. Before rolling is started, the mat shall be checked for defects in material or placement. Such defects shall be corrected to the satisfaction of the Engineer. Where it is impracticable due to physical limitations to operate the paving equipment, the Engineer may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a depth that will result in a completed pavement having the designed depth. Any deviation from standard crown or section shall be immediately remedied by placing additional material or removing surplus as directed by the Engineer. The Engineer may direct that other means of spreading be used to ensure a better control of the depths of material and the finished surface.

3.7 ROLLING AND COMPACTION

A. The mixture, after being spread, shall be thoroughly compacted by rollers having a minimum weight of 240 pounds per inch of wheel width as soon as it will bear the weight of the rollers without undue displacement. The number, weight, and types of rollers and sequences of rolling operations shall be such that the required density and surface are consistently attained while the mixture is in a workable condition.

B. Material may be spread by hand and thoroughly compacted by multiple passes of a roller weighing (with a mass) of not less than 500 pounds.

C. In sections inaccessible to the roller, the base course, surface course and backfill shall be hand-tamped with tampers weighing not less than 12 pounds, the face of which shall not exceed 50 square inches in area.

D. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

E. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

F. Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

G. Remove and replace paving areas mixed with foreign materials and defective areas and fill with fresh, hot top or binder course material. Compact by rolling to maximum surface density and smoothness.

3.8 MEETING EXISTING PAVEMENTS

A. Where new pavements will abut existing pavements, the Contractor shall sawcut the existing pavements to produce a uniform, smooth joint surface. Sawcutting of existing pavements shall be neat, straight and even lines, and done in a manner that prevents damage to the pavement to remain.

B. Full-Depth Pavement: Sawcut by approved method to the full depth of the pavement prior to placement of any new pavement. The sawcut surface shall be a neat true line with straight vertical edges free from irregularities. The sawcut surface shall be tack coated immediately prior to the installation of the new abutting bituminous concrete material to provide a bond between the old and new pavement. The new compacted pavement surface shall be finished flush with the abutting pavement.

C. Bituminous Concrete Overlays: The existing bituminous pavement shall be sawcut to a neat true line with straight vertical edges free of irregularities for a minimum depth of one and one half inches. One and one-half inches of pavement shall be removed to form a transition section across the entire pavement width and with a length of two feet at driveways and six feet in roadways and parking areas. Immediately prior to the placement of the bituminous concrete overlay, the sawcut edges of the existing pavement shall be tack coated to bond the new pavement to the old pavement. The new pavement surface shall be finished flush with the abutting pavement. The surface seam of the pavement joint shall be sealed with tack coat and back sanded.

3.9 BACKFILLING AND REMOVAL OF SURPLUS MATERIAL

A. The sides of the sidewalk shall be backfilled with suitable material thoroughly compacted and finished flush with the top of the sidewalk or driveway.

B. All surplus material shall be removed and the Project Site left in a neat and presentable condition to the satisfaction of Engineer.

END OF SECTION

SECTION 32 1316

POST-TENSIONED CONCRETE TENNIS COURT

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Installation of post-tensioned concrete tennis court(s).

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. State of Connecticut.

1. Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016 and any supplements.

D. American Concrete Institute (ACI)

1. ACI 302.1R—Guide for Concrete Floor or Slab Construction.

2. ACI 304R-00—Guide for Measuring, Mixing, Transporting, and Placing Concrete.

3. ACI 305R-10—Guide to Hot Weather Concreting.

4. ACI 306R-10—Guide to Cold Weather Concreting.

E. ASTM International (ASTM)

1. ASTM A416—Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.

2. ASTM A615—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

3. ASTM C171—Standard Specification for Sheet Materials for Curing Concrete.

4. ASTM C476—Standard Specification for Grout for Masonry.

5. ASTM C920—Standard Specification for Elastomeric Joint Sealants.

6. ASTM C1107—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

7. ASTM D1752—Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

8. ASTM D4397—Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.

9. ASTM E329—Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

F. Department of Defense Specifications

1. Federal Specification MIL-PRF-3420—Military Specification: Packaging Materials, Volatile Corrosion, Inhibitor Treated, Opaque.

G. Post Tensioning Institute (PTI)

1. Design and Construction of Post-Tensioned Sport Courts (latest edition).

2. Post-Tensioning Manual (latest edition).

3. Construction and Maintenance Procedures Manual for Post-Tensioned Slab-on-Ground Construction (latest edition).

4. Training and Certification of Field Personnel for Unbonded Post-Tensioning.

1.3 SUBMITTALS

A. Bid Submittals

1. Qualifications as required herein and as may be defined in other portions of the Bid Documents.

B. Sampling and Testing Laboratory—Submit name and qualifications of commercial sampling and testing laboratory for Engineer's approval.

C. Testing Agency—Submit name and qualifications of third-party in-field quality control Testing Agency for Engineer's approval.

D. Stressing Inspector—Submit name and qualifications of third-party inspection personnel who will monitor, document, and certify stressing/tensioning operations.

E. Product Data: Submit manufacturer's specifications and installation instructions for all products in the post-tensioned concrete tennis court, including certifications and other data as may be required, to show compliance with the Contract Documents.

1. Concrete Mix. Comply with submittal requirements of Section 03 3200—Site Cast-in-Place Concrete.

2. Sand.

3. Polyethylene sheeting.

4. Reinforcing steel.

5. Steel cable tendons.

6. Tendon sheathing.

7. Tendon anchors.

8. Tendon supports.

9. Waterproofing compound.

10. Bonding agent.

11. Isolation foam filler.

12. Elastomeric joint sealants.

F. Shop Drawings

1. Provide complete Shop Drawings of the post-tensioned tennis court(s) indicating the configuration, dimensions, layout, and spacing of major and minor components required for a complete, functional post-tensioned system. Include the locations of slab, reinforcing steel, tendons, stressing ends, fixed ends, fencing, electrical outlets, and other appurtenances. Show in large-scale details of any unique fabrication, assembly, configuration, and/or installation requirements.

    a. The tendon layout shown on the Drawings is conceptual. Include Shop Drawings that depict proposed tendon layout based on the court configuration shown on the Drawings and the PTI “Design and Construction of Post-Tensioned Sport Courts”.

2. Include a narrative Work Plan to describe proposed timing, sequence, phasing, means, and methods of post-tensioned court installation.

G. Testing/Monitoring Reports

1. Submit testing and monitoring reports for all testing conducted under this Section.

H. Certificates

1. Submit certificates stating that supplied tendons comply with these specifications.

2. Submit certificates for the concrete design mix.

I. Delivery Tickets: Ready-mixed concrete manufacturer shall provide duplicate delivery tickets with each load of concrete delivered to the Project Site. Delivery tickets shall provide the following information in addition to that required by ASTM C94.

1. Type and brand cement.

2. Cement content in pounds per cubic yard of concrete.

3. Maximum size of aggregate.

4. Amount and brand name of admixtures.

5. Total water content expressed by water/cement ratio.

J. Post-Installation

1. Tendon Layout: Complete court diagram showing the locations of all tendons with measurements from fixed points.

2. Stressing Data: Submit all observations and final tension chart certifying the accuracy of all tensions pulled.

3. Certification: Written certification from the Stressing Inspector confirming the accuracy of all tensions pulled and compliance with applicable stressing/tensioning requirements.

4. Post-tensioned court warranty.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.

B. Installer's Qualifications:

1. Company Qualifications: Provide a summary of qualifications and experience that demonstrate the company is competent to complete the level of work outlined in this project.

a. A minimum of ten (10) reference projects consisting of post-tensioned concrete tennis courts completed within the past three (3) years. Reference projects shall be at least equal to the square-footage of the proposed project.

b. Project Information: At a minimum, provide the following information for each reference project:

1) Project Name

2) Project Location

3) Project scope

4) Construction timeline

5) Construction cost

6) Reference name, title, affiliation, and contact information.

c. All installation personnel should be certified under one of the certification categories of the PTI "Training and Certification of Field Personnel for Unbonded Post-Tensioning".

2. Project Manager/Superintendent Qualifications: Provide a summary of Project Manager/Superintendent's experience on similar projects.

a. A minimum of ten (10) reference projects consisting of post-tensioned concrete tennis courts completed within the past three (3) years. Reference projects shall be at least equal to the square-footage of the proposed project.

b. Evidence of "Level 2" Unbonded PT Field Installation certification or Slab-on-Ground Installer/Stressor under the PTI "Training and Certification of Field Personnel for Unbonded Post-Tensioning".

c. Such Project Manager/Superintendent shall be the on-site and day-to-day contact person for the duration of the project. Provide Contact Name, Address, Phone Number, Fax Number and e-mail address.

C. Stressing Inspector Qualifications: Certified by the PTI under the Post-Tensioning Inspector requirements of the "Training and Certification of Field Personnel for Unbonded Post-Tensioning" program with at least five (5) years' experience in the monitoring of stressing/tensioning operations for post-tensioned concrete court systems.

D. Layout Review: Stake and lay-out post-tensioned court(s) for review by Engineer prior to excavation, setting forms, etc.

E. Monitoring, Testing, and Inspections:

1. Notify Engineer a minimum of 24 hours prior to placement of any concrete to inspect sub-grade, forms, reinforcement, and tendon placement.

2. Notify Testing Agency/Testing Laboratory a minimum of 24 hours prior to any required in-field sampling, testing, or monitoring.

3. Notify Stressing Inspector a minimum of 48 hours prior to delivery of tendons and beginning stressing/tensioning operations.

F. Concrete testing: Concrete sampling/testing shall be performed by an approved Testing Agency and/or Testing Laboratory experienced in sampling and testing concrete. Testing agency shall meet the requirements of ASTM E329.

1.5 TESTING

A. Quality control testing during construction shall be the responsibility of Contractor.

B. Concrete Testing: Contractor shall retain and pay for the services of a licensed third-party testing entity/laboratory to perform all testing in accordance with applicable standards.

1. Comply with the Article "Testing" Section 03 3200—Site Cast-in-Place Concrete.

2. Additional cylinders will be required to confirm concrete strength for initial stressing.

C. Tendon Stressing: Contractor shall retain and pay for the services of a third-party Stressing Inspector to observe, monitor, and document all stressing operations.

1. Stressing Inspector shall provide written certification of inspections and written certification of the accuracy of all tensions pulled.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Concrete: Comply with Section 03 3200—Site Cast-in-Place Concrete.

B. Prestressing Steel Tendons

1. Protect against physical damage and corrosion at all times from manufacture to final installation and end grouting. A rust-preventing corrosion inhibitor should be placed in the package or be incorporated in the carrier type packaging material. The corrosion inhibitor should have no deleterious effect on the steel, concrete, or grout. The inhibitor carrier type packaging should conform to Federal Specification MIL-PRF-3420. Damaged packaging should be replaced or restored to its original condition.

2. All strands from each manufactured reel to be shipped to the Project Site should be assigned an individual Lot Number and be tagged in a manner that each such Lot can be accurately identified at the Project Site. Each lot delivered to the Project Site shall be accompanied by a manufacturer's certificate stating that tendons comply with these Specifications. All unidentified strands or loss of positive proof of identification is sufficient reason for rejection.

3. Strands shall be clearly identified as low-relaxation (stabilized) strand per ASTM A416 and the corresponding Lot number for which quality control test samples have been taken. Strands not so designated shall be rejected.

4. Strands should be examined by Contractor and inspected by the Stressing Inspector upon delivery to the Project Site. During use, any reel that is found to contain broken wires or corrosion should be removed and discarded.

5. Protect all materials during storage to avoid corrosion, abrasion, and other construction activities.

6. Tendons shall not be stored at the Project Site longer than 14 days.

1.7 PROJECT/SITE CONDITIONS

A. Comply with Section 03 3200—Site Cast-in-Place Concrete.

1.8 WARRANTY

A. Post-Tensioned Slab: Provide a Contractor's Special Warranty in the Owner's name for the post-tensioned concrete court system. Provide a fifteen (20) year warranty against cracks, spalling, heaving, or tendon failure.

B. Court Appurtenances: Provide manufacturer's standard warranty, as applicable, for all products furnished under this Section. Warranty shall be registered in Owner's name.

C. Bind warranties in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½-by-11-inch paper.

D. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.

E. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of Contractor.

F. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS

2.1 GENERAL

A. Unless otherwise noted, all components of the post-tensioning system shall meet the requirements of the "Guide Specifications Post-Tensioning Materials" of the PTI "Post-Tensioning Manual".

2.2 PORTLAND CEMENT

A. Cement: ASTM C150. One brand and type of cement shall be used for formed concrete having exposed-to-view finished surfaces.

B. Unless otherwise specified, cement shall be Type I.

2.3 READY-MIX CONCRETE

A. Ready Mix Concrete: Portland Cement Concrete, ASTM C94.

1. Compressive Strength:

a. Unless otherwise indicated, minimum compressive strength at 28 days shall be 4,000 psi minimum.

2. Water/cement ratio: Maximum 0.45-0.52.

3. Slump: no less than 4 inches, not greater than 6 inches, ASTM C143 unless otherwise approved by Engineer.

4. Air Entrainment: 2+/-1

5. Standard Color: White or natural grey.

B. Aggregate

1. Coarse aggregate: ASTM C33. Broken stone or gravel consisting of clean durable fragments of uniform quality throughout, with maximum size of 1 inch. Aggregate shall be free from soft, disintegrated pieces, mud, dirt, organic or other injurious material. Coarse aggregate of a size retained on a 1-inch square opening sieve shall not contain more than 8% of flat or elongated pieces, whose longest dimension exceeds five times their maximum thickness.

2. Fine aggregate: ASTM C33. Sand consisting of clean, hard, durable, uncoated particles of quartz or other rock, free from lumps of clay, soft or flaky material, loam, organic or other injurious material. Fine aggregate shall contain not more than 3% of material finer than a #200 sieve, ASTM C117.

C. Water: Potable quality.

D. Admixtures

1. No admixtures other than those specified shall be used in the concrete without the specific written permission of Engineer in each case.

2. Concrete shall contain a water reducing agent, ASTM C494, to minimize cement and water content of the concrete mix at the specified slump.

3. No fly ash or other pozzolans are permitted in the mix.

4. No calcium chloride or admixtures containing calcium chloride or chlorides shall be added to the concrete.

2.4 CURING MATERIALS

A. Waterproof paper, ASTM C171, regular or white.

B. Polyethylene sheeting, ASTM C171.

C. Membrane forming spray-on chemical compounds are not permitted.

2.5 GRANULAR FILL

A. Comply with Section 31 2310—Earthwork.

2.6 SAND

A. Sand shall consist of clean, hard, durable, uncoated particles of quartz or other rock. It shall not contain more than 3% of material finer than a #200 sieve.

B. Organic Impurities: Fine aggregate subjected to the colorimetric test shall not produce a color darker than Gardner Color Standard No. 11, using AASHTO T 21. If the fine aggregate fails to meet this requirement, the provisions of AASHTO M 6, Section 5.2, will govern.

C. Sand shall be uniformly graded as follows:

Gradation of Sand

Sieve	Percent Passing by Weight
⅜″	100
No. 4	95–100
No. 8	80–100
No. 16	50–85
No. 30	25–60
No. 50	10–30
No. 100	2–10

D. The above gradation represents the extreme limits which shall determine suitability for use from all sources of supply. The gradation from any one source shall be reasonably uniform and not subject to the extreme percentages of gradation specified above. For the purpose of determining the degree of uniformity, a fineness modulus determination will be made upon representative samples from any source. Fine aggregate from any one source having a variation in fineness

modulus greater than 0.20 either way from the fineness modulus of the representative sample will be rejected.

2.7 POLYETHYLENE SHEETING

A. Vapor Barrier/Bond Breaker: 10 mil, ASTM D4397.

2.8 GROUT

A. Non-shrink, non-metallic grout, bagged, pre-mixed formulations, ASTM C1107, or site mixed, ASTM C476.

2.9 FORMS

A. Forms shall be substantially built and adequately braced so as to withstand the liquid weight of concrete without deforming. All linings, studding, walling and bracing shall be such as to prevent bulging, spreading, or loss of true alignment while pouring and displacement of concrete while setting.

B. All edge forms for sidewalk pavements, curbs and gutters shall be of sufficient rigidity and adequately braced to accurately maintain line and grade. Form work shall be designed so that sections may be fastened together to prevent vertical or horizontal movement of ends.

C. Forms: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials. Form work materials shall produce a smooth, continuous, straight, and level surface.

1. Plywood shall be APA A-A, A-B or A-C, Class 1, Exterior Grade. Thickness shall be as required to prevent movement or deformation but shall not be less than ⅝″ thick.

D. Form Ties: Provide prefabricated, adjustable length galvanized steel snap-off ties, with brackets, cones, corner locks and other accessories as necessary.

E. Form Release Agent: Commercial formulation compounds that will not bond with, stain or adversely affect concrete.

2.10 REINFORCEMENT MATERIALS

A. Reinforcing Bars: ASTM A615, Grade 60 deformed bars.

2.11 TENDONS

A. Steel, low relaxation strand, seven-wire cable, nominal ½″ diameter, ASTM A416 Grade 1860 (270 ksi).

1. Tendons shall be unbonded.

2. Strand shall be coated with a rust preventive lubricant and encased in an extruded plastic slippage sheathing to provide increased resistance to damage during handling and construction. Minimum sheathing thickness shall be 0.050 inches (50 mils).

B. All cables shall be designed for one (1) stressing end and one (1) fixed end. All tension shall be pulled from two of four sides. Tendons that are to be stressed from one end only shall have fixed-end anchorages attached to one end prior to shipment.

C. Torn or damaged sheathing shall be repaired by coating the strand with grease and wrapping with plastic prior to placement of concrete. Small nicks may be repaired by removing any grease on the exterior of the sheathing and wrapping the damaged area securely with plastic tape.

D. Grommets or pocket formers shall be provided at all stressing anchorages. pocket formers should be coated with form release agent prior to installation for easy removal.

E. Appropriate anchorages shall be provided for dead end and end stressing anchors.

F. Tendons shall be fabricated with sufficient length beyond the edge forms to allow stressing. A minimum length of 18 inches from each stressing end is required.

2.12 TENDON SUPPORTS/CHAIRS

A. Intersectional chairs as manufactured by General Technologies, Inc. (Stafford, TX) or approved equal. Sized for ½-inch cable tendon and 5 inch slab thickness.

2.13 ISOLATION JOINT FILLER.

A. Synthetic foam joint material, ASTM D1752, 1-inch thick.

2.14 SEALANTS

A. Joint Sealant Compound, ASTM C920

B. Self-Leveling (Type SL; Grade “P”)

1. Cold-applied and self-leveling, Type S or Type M elastomeric polymer sealant.

C. Gun-Grade (Non-Sage; Grade “NS”)

1. One-component (Type S) high-performance moisture-curing polyurethane sealant specifically formulated for bonding to masonry and concrete.

D. Color: As approved by Engineer.

PART 3 EXECUTION

3.1 GENERAL

A. All work shall conform to PTI standards, manuals, and guides as applicable. Provide a summary of proposed deviations from these references in Shop Drawings for Engineer’s approval.

B. Verify site conditions before proceeding with the work. Field check the accuracy of the Drawings and inspect structures, utilities, and other site features prior to start of work and notify Engineer in writing, of any hazardous conditions and/or discrepancies.

3.2 PREPARATION

A. Protect court or adjacent improvements which are to remain during construction.

B. Remove existing court facilities by cutting posts, anchors, or other fixtures flush with the existing court surface. Fill voids or open tubes with sand, flowfill, or non-shrink grout.

C. Leveling:

1. Carefully review the surface of the existing court slabs. Any irregularities, such as spalls or open joints or cracks, that could result in "keying" of the overlay with the existing court surface shall be filled and finished smooth and flush with the existing court surface.

    a. Fill cracks with sand, flowfill, or non-shrink grout.

2. Where minor depressions are present, fill with Sand or flowfill flush with the existing court surface. Where filling of large voids is required, fill with compacted Granular Fill or flowfill flush with existing court surface.

3. Remove heaves or high spots flush with the existing court surface by grinding or other approved method.

D. Measure elevations across the surface of the existing court to verify and ensure that proper grades and slopes exist and that installation of a uniform thickness overlay slab will translate to proper grading and sloping of the new overlay slab surface. Coordinate with the proposed lines and grades of the final court surface indicated on the Drawings. Provide sand adjustment/leveling course as required to meet proposed final grades.

    1. Promptly notify Engineer of discrepancies and do not proceed with the work until resolution.

E. Install sleeves, bench posts, or other penetrations as indicated on the Drawings. Install isolation joint filler around all penetrations for the full depth of the slab. Provide recess at the top to receive sealant.

3.3 VAPOR BARRIER/SEPARATION LAYER

A. Provide full coverage of the court area with 2 layers of 10 mil polyethylene sheeting. Install the second layer perpendicular to the first layer. Lap all joints a minimum of 6 inches and seal with pressure sensitive plastic tape.

B. Ensure polyethylene sheeting is smooth and level over the existing slab surface. Bunching of sheeting will not be permissible and shall be corrected prior to concrete placement.

C. Repair any tears or damage to the sheeting prior to concrete placement.

3.4 FORMS

A. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

B. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage. All forms shall be cleaned and oiled before concrete is placed against them.

C. Accurately set forms to line and grade and over full length of court(s) and oil before use. Verify elevations and correct variations exceeding 0.01 foot above or below grade or more than 0.01 foot from prescribed alignment.

3.5 INITIAL TENDON INSTALLATION

A. Unless otherwise noted, the post-tensioning system, including shipping, handling, storage, placement of tendons and anchorages, stressing, and finishing, shall be in accordance with the PTI "Construction and Maintenance Procedures Manual for Post-Tensioned Slab-on-Ground

Construction," and the "Design and Construction of Post-Tensioned Sport Courts". Provide a summary of proposed deviations from these references in Shop Drawings for Engineer's approval.

B. Place tendons according to the layout on approved Shop Drawings. Vertical placement tolerance shall be within ½″ from the specified tendon location. Excessive curvature, either vertically or horizontally, in the judgment of Engineer or Stressing Inspector shall be corrected prior to concrete placement.

C. Place chairs at the intersections of all tendons and securely tie tendons together and to the chairs. Provide and install additional chairs if required to provide straight, level and secure tendon installations. All tendons shall be tied and supported securely to prevent movement or displacement of tendons during concrete placement. Do not over-tighten tie wires to avoid damage to tendon sheathing.

3.6 REINFORCING STEEL

A. Install continuous perimeter reinforcing bars along edges of the slab as indicated on the Drawings.

3.7 CONCRETE INSTALLATION

A. Comply with applicable provisions of Section 03 3200—Site Cast-in-Place Concrete and applicable portions of ACI Guides referenced herein.

B. Notify Engineer a minimum of 24 hours prior to placement of any concrete to inspect sub-grade, forms, reinforcement, and tendon placement.

C. Pre-Pour Inspections: Do not proceed with concrete placement until all pre-pour inspections have been approved by Engineer.

1. Tendons: Prior to placement of concrete, inspect condition of all tendon sheathing for damage of any kind.

   a. Any damage that ruptures or penetrates the sheathing and exposes the grease or steel strand of the tendon shall be repaired prior to placement of concrete.

   b. Examine locations where tendons are tied to chairs to ensure that tie wire has not cut, penetrated, or damaged the sheathing.

   c. Grease on the outside surface of sheathing shall be removed.

   d. The observance of unrepaired damage to tendon sheathing or grease on the outside of the sheathing by Engineer or inspector prior to a scheduled concrete pour will be grounds for cancellation of the pour.

   e. The appearance of grease spots at the surface of the completed tennis court(s) shall be considered grounds for rejection of construction.

2. Penetrations: Prior to placement of concrete, inspect posts, sleeves, and any other elements that will penetrate the slab to verify location, plumb, and final configuration of isolation joint filler.

3. Form Inspection: Prior to placement of concrete, verify final line and grade of forms and correct as required.

D. Placement

1. Remove debris and foreign material from interior of forms before start of concrete placing.

2. Each court slab shall be poured as one continuous slab without jointing.

3. Place concrete with direct application or pumps. Do not allow free drop of more than five (5) feet and consolidate with mechanical vibrators as required. Ensure concrete is consolidated at all anchorages.

4. Avoid displacement, shifting or movement of tendons and/or damage to tendon sheathing.

5. Finish court surface as required by the court surfacing manufacturer. Wetting of the surface of the concrete by the application of water via machine, brush, or other means during finishing is not permitted.

6. Do not begin finishing while bleed water is present at the surface of the slab or is coming to the surface. If necessary, bleed water shall be drawn off with squeegees or by dragging a rubber hose over the surface.

7. Chamfer or round perimeter edges as indicated on the Drawings.

E. Curing

1. Apply plastic sheeting or waterproof paper and cure for a minimum of seven (7) days. Secure polyethylene sheeting from displacement.

2. Use moist curing methods. Do not over-apply water that may compromise the finish of the slab.

3. Fill and finish sections that are out of tolerance with hydraulic cement filler.

3.8 TENDON STRESSING

A. All tendon stressing operations shall be monitored by the Stressing Inspector.

1. Provide a minimum of 48 hours advanced notice to the Stressing Inspector prior to beginning stressing/tensioning operations.

2. Stressing Inspector shall not be changed once stressing/tensioning operations have started.

3. Record all measurements on the appropriate post-tensioning stressing record forms.

B. Initial Stressing: Commence initial stressing operations as soon as concrete has attained a compressive strength of 1,500 psi. It is assumed that this will occur within 48 hours after placement of concrete when ambient temperatures are between 50 degrees F and 80 degrees F. Time period will vary based on actual cure conditions. Concrete strengths are to be demonstrated by cylinders taken and cured under the same conditions as the slab.

1. Initial tension: 7–10 kips but not more than 50% of the final jacking force.

2. Stressing Inspector shall monitor all initial stressing/tensioning operations.

3. All initial stressing/tensioning operations shall be documented. Provide records of all initial stressing/tensioning operations.

C. Final Stressing: Commence final stressing operations as soon as concrete has attained a compressive strength of 2,000 psi. This will generally occur within seven (7) days after placement of concrete when ambient temperatures are between 50 degrees F and 80 degrees F. Time period will vary based on actual cure conditions. Concrete strengths are to be demonstrated by cylinders taken and cured under the same conditions as the slab.

1. Final tension: 33 kips.

2. Stressing Inspector shall monitor all final stressing/tensioning operations.

3. All final stressing/tensioning operations shall be documented. Provide records of all final stressing/tensioning operations and written certification of the accuracy of all tensions pulled.

D. After stressing has been completed and the stressing records approved, tendons shall be cut at each stressing pocket. Prior to cutting, confirm with the Stressing Inspector that jacking forces and elongations are satisfactory. Tendons should be cut as soon as possible after confirmation by Stressing Inspector of acceptable jacking forces and elongations.

E. Immediately following cutting of tendons, apply waterproofing compound to completely cover cable end and end anchor. Do not over-apply. Keep concrete surface within pocket free of waterproofing compound.

F. Following complete curing of the waterproofing compound, completely grout pocket and finish flush with the outside face of the slab.

3.9 PROTECTION OF FINISHED SURFACES

A. Protect all work from staining and damage during the entire operation and cure period. Damaged and stained areas shall be replaced or repaired to equal their original conditions at Contractor's expense.

B. Protect concrete surfaces from traffic for a minimum of seven (7) days after final stressing/tensioning and until court surfacing operations begin.

3.10 REPAIR AND CLEAN-UP

A. Repair: Defective work such as under-strength concrete, concrete out of line, level or plumb, or showing objectionable cracks, honeycomb, rock pockets, voids, spalling, exposed reinforcing, etc., shall be repaired or removed and replaced as directed by and to the satisfaction of the Engineer. All cleaning, patching, and repairs shall be subject to the Engineer's approval and acceptance.

B. Contractor shall clean up and remove from the site all spillage, overpour, discarded forming materials, rejected work or materials, and any other refuse or debris resulting from the work. Sweep concrete and wash free of stains, discolorations, dirt and other foreign materials just prior to final inspection.

C. Remove all debris, residuals, and materials at the conclusion of the work. Dispose of all materials in accordance with applicable waste management regulations.

END OF SECTION

SECTION 32 1823.53

COURT SURFACING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Textured acrylic surfacing for concrete courts.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. American Sports Builders Association (ASBA) Tennis court construction guidelines, latest edition.

D. State of Connecticut.

1. Standard Specifications for Roads, Bridges and Incidental Construction, Form 817, 2016 and any supplements.

E. ASTM International (ASTM)

1. ASTM E1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

2. ASTM G53 – Practice for Operating Light and Water Exposure Apparatus (Fluorescent UV Condensation Type) for Exposure of Nonmetallic Materials.

1.3 SUBMITTALS

1. Manufacturer specifications for components, color chart and installation instructions.

2. Authorized Applicator certificate from the surface system manufacturer.

3. International Tennis Federation (ITF) classification certificate for the surfacing system to be installed.

4. Reference list from the installer of at least 10 projects of similar scope done in the past 3 years.

5. The installation contractor must be able to supply the Owner, upon request, a list of 10 projects surfaced with the specified materials over the last five (5) years and that have required no maintenance.

6. Current Material Safety Data Sheets (MSDS).

7. Certificate of acceptance of the concrete court base from the surfacing installer prior to installation of the surface.

B. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. Test method similar to ASTM G53. The color system shall have an ITF pace rating in Category 3-Medium. Under no circumstances will systems from multiple manufacturers be considered.

1.4 COORDINATION

A. Contractor shall coordinate with all other trades, especially Site Contractors to ensure approval of concrete base prior to surfacing application. Any rework shall be done at no cost to the Owner.

1.5 QUALITY ASSURANCE

A. Curing compounds should not be used unless the curing compound manufacturer specifically states the surface may be coated with water based acrylic coatings.

B. New concrete shall be allowed to cure a minimum of 28 days prior to application of the work of this section.

C. Do not surface at temperatures below 55 degrees F or when rain or high humidity is imminent.

D. Do not apply surfacing when surface temperatures are 140°F or higher.

E. Do not use material that is, or has been frozen. Do not store surfacing materials in hot areas or in direct sunlight.

F. Contractor shall record the batch number of each product used on the site and maintain it through the warranty period.

G. Contractor shall provide the Engineer, upon request, an estimate of the volume of each product to be used on the site.

H. The surfacing installer shall be an authorized applicator of the surfacing system to be installed.

I. The surfacing manufacturer’s representative shall be available to help resolve material questions.

J. Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to insure quality and stability.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials in accordance with manufacturer specifications and MSDS.

B. Deliver product to the site in original unopened containers with proper labels attached.

1.7 WARRANTY

A. The Contractor shall be required to guarantee all labor, materials, workmanship and services for the acrylic surfacing.

B. Provide the manufacturer's standard warranty.

C. This Contractor shall be required to submit the following documents in regard to the guarantee:

1. Letter from the manufacturer(s) of all materials attesting to the guarantee length and limits. This must be signed by an officer of the organization.

2. Maintenance Instruction Guide for the Contract Surfaces, signed by an officer of the surface company and notarized.

3. Letter of Guarantee from the Installation Contractor for the above time period, signed by an officer of the Company and notarized.

4. These documents shall be submitted to the Owner prior to final payment. The installer and the materials manufacturer shall supply a warranty covering labor and materials respectively. The warranty period shall be for five (5) years.

1.8 SURFACING INSTALLER QUALIFICATIONS

A. Installer shall be regularly engaged in construction and surfacing of acrylic tennis courts, play courts or similar surfaces.

B. Installer shall be an Authorized Applicator of the specified surface system.

C. Have completed 15 projects of similar scope done in the past 3 years using the same materials.

D. Have completed 10 projects surfaced with the specified materials over the last five (5) years and that have required no maintenance.

1.9 MANUFACTURER QUALIFICATIONS

A. System manufacturer shall provide documentation that the surface to be installed has been classified by the ITF as a medium pace surface.

B. System manufacturer shall provide documentation that the surface to be installed is correct for its intended product use.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. California Products Corp., Andover, MA. 01810 / Plexi Hardcourt System www.californiasportssurfaces.com.

B. TPS 5000 Color Coating, www.hellasconstruction.com.

C. NovaPlay, Nova Sports, Milford, MA, www.novasports.com

D. Approved Equal.

2.2 Substitutions: Submit requests at least 7 days prior to date the work will be performed with a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to the specified product. Information must include a QUV test of at least 2000 hours illustrating the UV stability of the system. The system shall have an ITF pace rating in Category 3-Medium. Under no circumstance may the final color surface contain silica sand added at the job site.

2.3 GENERAL

A. Surfacing System shall be appropriate in type and materials for applications to Concrete base materials. Concrete base material shall meet the minimum curing times recommended by the manufacturer prior to placement of surfacing.

B. Use of the complete line of surfacing products that form the surfacing Manufacturers system shall be used for each type of substrate material and additive used. Use of approved manufacturers recommended surfacing system shall be followed at all times. Use of materials not specifically called for by the Manufacturer for use in its products shall be subject to rejection and replacement at the contractors expense.

C. All surfacing materials shall be non-flammable.

D. Patching & Leveling Mix: Shall be 100% acrylic resin for use in patching cracks, holes, depressions and other surface imperfections.

E. Concrete Preparer shall be a specially formulated acid for use in neutralizing the concrete in preparation for installation of the Surfacing System.

F. Adhesion Primer – shall be a two component water based epoxy primer for uncoated concrete surfaces.

G. Acrylic Filler Course – shall be used as a filler for new or existing concrete surfaces. The 100% acrylic filler shall be blended with approved silica sand at the job site.

H. Acrylic Color Playing Surface– Shall be used as the finish color and texture. A two part system blended to achieve the correct surface texture.

I. The surface to be installed shall be classified by the International Tennis Foundation (ITF) as a medium pace surface.

J. Line Paint – for use as the line marking on the court/play surface.

K. Water – for use in dilution/mixing shall be clean and potable.

L. Sand – washed silica sand for use as texture in the filler and playing surface courses.

2.4 MATERIALS

A. Court Patch Binder – Shall be a mix of 100% acrylic resin blended with Portland Cement and sand intended for repairing depressions, cracks or other irregularities up to ¾” in depth.

1. Percent solids by weight (minimum) 46%

2. Mix density 8.7-8.9 lbs./gallon

B. Crack Filler – shall be 100% acrylic resin heavily mixed with sand. Crack Filler shall be highly flexible, asbestos free high solids filler intended for filling cracks.

1. Percent solids by weight (minimum) 46%

2. Mix density 15 lbs./gallon

C. Concrete Preparer – Shall be specially formulated, self neutralizing, acid mixed with water for etching /pre-treatment of previously uncoated Portland Cement Concrete. Preparer shall be Phosphoric Acid/Zinc Chloride based surface treatment.

1. Percent solids by weight (minimum): 25.5%

2. Weight:9.5-9.6 lbs./gallon

D. Epoxy Primer/Sealer – shall be a moisture cured, one part epoxy primer intended as a base for water based acrylic surfacing systems on prepared, new or uncoated concrete.

1. Percent solids by weight (minimum): 95%+/-

2. Weight:10.5 lbs./gallon

E. Acrylic Resurfacer – a mix of asbestos free 100% acrylic resin binder (no vinyl copolymerization constituent). Intended for mixing with sand and water. The product shall contain not less than 3.5% attapulgite.

1. Percent solids by weight (minimum): 40.25%

2. Weight:10.8 lbs./gallon

F. Finish Course: shall be pigmented, 100% Acrylic Resin (no vinyl copolymerization constituent) intended for mixing with selected color base and sand. Green shall contain not less than 8% chrome oxide.

1. Percent solids by weight (minimum): 36.5%

2. Weight: 9.45 lbs./gallon

G. Line Paint – 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.

1. Percent solids by weight (minimum): 70%

2. Weight: 14 lbs./gallon

H. All surfacing materials shall be non-flammable and have a VOC content of not less than 100g./ltr. Measured by EPA method 24.

I. Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to insure quality and stability.

J. Asphalt or tar in any form will not be permitted in any coating.

2.5 COLORS

A. Inbound Areas: **Stadium Blue**

B. Out of Bounds Areas: **Grass Green**

C. Colors shall be from manufacturer's standard color palette.

PART 3 EXECUTION

3.1 GENERAL

A. Verify site conditions before proceeding with demolition work. Field check the accuracy of the Drawings and inspect structures, utilities, and other site features prior to start of work and notify Engineer in writing, of any hazardous conditions and/or discrepancies.

B. Ensure that the concrete has been allowed to cure at least 21 days prior to commencing work under this section.

C. Concrete flat work shall be accepted by the surfacing installer, in writing, prior to applying surfacing.

3.2 WEATHER LIMITATIONS

A. Do not install when rainfall in imminent or extremely high humidity prevents drying.

B. Do not apply unless surface and air temperature are 50°F and rising.

C. Do not apply if surface temperature is in excess of 140°F.

3.3 PREPARATION

A. Care shall be taken to protect adjacent areas and structures (fences, posts, sidewalks, buildings, etc.) which are not to be coated. In the event that coatings are applied to above, remove immediately before drying occurs.

B. Cleaning: Clean surfaces of loose dirt, oil, grease, leaves, and other debris in strict accordance with manufacturer's directions. Pressure washing will be necessary to adequately clean areas to be coated. Any areas previously showing algae growth shall be treated with bleach solution or approved product to kill the organisms and then be properly rinsed.

C. Cracks and holes shall be cleaned and a suitable soil sterilant, as approved by the Engineer, shall be applied to kill all vegetation 14 days prior to any surfacing or crack repair.

D. Holes and cracks: Shall be cleaned of all loose material and filled with Court Patch Binder according to manufacturer's specifications.

E. Depressions: Depressions holding enough water to cover a five cent piece shall be filled with Court Patch Binder Patching Mix of 3 gallons of Court Patch Binder, 100 lbs. 60-80 silica sand, 1 gallon Dry Portland Cement (Type I). This step shall be accomplished prior to the squeegee application of Acrylic Resurfacer. The contractor shall flood all the courts and then allow draining. Define and mark all areas holding enough water to cover a nickel. After defined areas are dry, prime with tack coat mixture of 2 parts water/l part Court Patch Binder.

Allow tack coat to dry completely. Spread Court Patch Binder mix true to grade using a straight edge (never a squeegee) for strike off. Steel trowel or wood float the patch so that the texture matches the surrounding area. Never add water to mix. Light misting on surface and edges to feather in is allowed as needed to maintain work ability. Allow to dry thoroughly and cure.

F. The surface to be coated shall be inspected and made sure to be free of grease, oil and other foreign matter before starting the work. The Contractor shall remove by broom, vacuum, blower or power washer all dust, dirt, imbedded soil, etc., as necessary to provide a clean surface to receive the color system.

G. Cleaning of the surface shall be approved by the installer prior to any further work.

H. Concrete Preparer shall be applied to all uncoated concrete surfaces at the rate of .01 to .012 gallon per square yard. Dilute 1 gallon of Concrete Preparer with 4 gallons of potable water. Apply liberally to the surface and spread with a soft hair push broom. After the surface has dried remove any dust or latent material.

I. Epoxy Primer shall be applied to all uncoated concrete surface prior to application of filler materials. Apply at an application rate of 1 gallon per 110-120 square feet.

1. Mix according to manufacturer's instruction for the specific application.

2. Apply with a short nap phenolic core roller.

3. While primer is still fresh, broadcast 40-60 mesh silica sand over the primer by mechanical means at a rate of 2-3 pounds for every 4-5 square feet.

4. Allow the epoxy primer to dry for approximately 1-3 hours until the surface is slightly tacky to the touch. In no case shall the surface be left overnight before receiving an application of Acrylic Resurfacer.

J. Acrylic Resurfacer (filler course): On the properly applied primer the filler course shall be applied to the clean underlying surface in one application to obtain a total quantity of not less than .06 gallon per square yard based on the material prior to any dilution. Acrylic Resurfacer may be used to pre-coat depression and crack/hole repairs to achieve better planarity prior to filler course application. The in depth filler coat coloring shall match the color combination for the finished surface.

1. Over a properly repaired surface of concrete, apply two coats of the filler course according to the following mix:

   a. Acrylic Resurfacer 55 gallons

   b. Water 20-40 gallons

   c. Sand 600-800 lbs./60-80 mesh

   d. Liquid Yield 112-138 gallons

2. On new concrete, a minimum of two coats of Acrylic Resurfacer may be used to properly fill all voids in the surface. Use clean, dry 50-60 mesh sand and clean, potable water to make mixes. The quantity of sand and water in the above mix may be adjusted within above limits to complement the roughness and temperature of the surface.

3. The quantity of water used in diluting these coatings shall not exceed the quantity specified by the manufacturer. Manufacturer may recommend additional water if too rapid drying is occurring because of weather conditions. Permission of the Engineer shall be obtained before adding any additional water.

4. Mix the ingredients thoroughly using accepted mixing devices and use a 70 Durometer rubber bladed squeegee to apply each coat of Acrylic Resurfacer as required.

5. Allow the application of Acrylic Resurfacer to dry a minimum of 24 hours prior to surfacing. Scrape off all ridges and rough spots prior to any subsequent application of Acrylic Resurfacer or subsequent cushion or color surface system.

3.4 APPLICATION OF ACRYLIC FINISH COURSE

A. All areas to receive finish course shall be leveled and prepared per manufacturers instructions, clean, free from sand, clay, grease, dust, salt or other foreign matters. Contractor shall obtain Engineer's approval, prior to applying any surface treatment.

B. Blend color base and acrylic resin finish course with a mechanical mixer to achieve a uniform mixture. The mix will conform to manufacturer’s instructions shall be:

1. Color Base: 30 Gallons

2. Finish course (Acrylic Resin): 20 Gallons

3. Water: 20 Gallons

C. Application shall be made by 50 durometer rubber faced squeegees. The uniform mixture should be poured on to the court surface and spread to a uniform thickness in a regular pattern.

D. A total of 3 applications of the uniform finish course mixture shall be made to achieve a total application rate of not less than .15 gal./sy. No application should be made until the previous application is thoroughly dry.

3.5 LINE PAINTING

A. Upon completion and acceptance of the court surface, the Contractor shall prepare and paint lines for the appropriate sport court.

B. Each court shall be marked per plans and details.

C. Lines shall be 2” wide unless otherwise noted on the drawings. Lines hall be carefully laid out in accordance USTA and ASBA requirements. Lines to be marked shall be taped on both sides to insure a crisp edge. All areas that have overlapped, ghosted, or blurry color or edges shall be corrected.

D. Line Paint shall have a texture similar to the surrounding play surface. Application shall be made by hand with a brush or roller at the rate of 150-200 sf/gal. (3/4 gal. per tennis court).

E. Line layout shall be accurately set to within 1/8" tolerance. Any lines outside of specified tolerance shall be removed and re done within specified tolerances at the contractors expense.

3.6 CLEANING

A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.

3.7 PROTECTION

A. Erect temporary barriers to protect coatings during drying and curing.

B. Lock gates to prevent use until acceptance by the owner's representative.

3.8 CLEAN UP

A. Contractor shall remove all debris, layout tacks, residuals, and materials at the conclusion of the work.

END OF SECTION

SECTION 32 3113

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Furnishing and installing woven wire fencing systems of the type and height specified and supported by metal posts erected where indicated on the Drawings and as specified herein, including fence and gates.

B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

1.2 REFERENCES

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. ASTM International (ASTM).

1. ASTM A90 – Standard Test Method for Weight (Mass) of Coating on Iron or Steel Articles with Zinc or Zinc Alloy.

2. ASTM A123 – Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

3. ASTM A153 – Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.

4. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.

5. ASTM A392 – Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

6. ASTM A428 – Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles.

7. ASTM A491 – Standard Specification for Aluminum Coated Steel Chain Link Fence Fabric.

8. ASTM A780 – Standard Specification for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

9. ASTM A817 – Standard Specification for Metallic-Coated Steel Wire for Chain Link Fence Fabric and Marcelled Tension Wire.

10. ASTM A824 – Standard Specification Metallic-Coated Steel Marcelled Tension Wire for Use with Chain Link Fence.

11. ASTM B211 – Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.

12. ASTM C94 – Standard Specification for Ready-Mixed Concrete.

13. ASTM F552 – Standard Terminology Relating to Chain Link Fencing.

14. ASTM F567 – Standard Practice for Installation of Chain Link Fence.

15. ASTM F626 – Standard Specification for Fence Fittings.

16. ASTM F668 – Specification for Polymer Coated Chain Link Fence Fabric.

17. ASTM F900 – Standard Specification for Industrial and Commercial Swing Gates.

18. ASTM F934 – Specification for Standard Colors for Polymer-Coated Chain Link.

19. ASTM F1043 – Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.

20. ASTM F1083 – Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

21. ASTM F1183 – Standard Specification for Aluminum Alloy Chain Link Fence Fabric.

22. ASTM F1664 – Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence.

D. Chain Link Fence Manufacturer's Institute

1. Chain Link Fence Manufacturer's Institute Product Manual, latest revision.

1.3 SYSTEM DESCRIPTION

A. Chain Link Fence:

1. Fence Height: Varies, refer to the Drawings.

2. Mesh Size: 1.75 inches.

3. Mesh Gage: 9, measured prior to application of any coating.

4. Gates: Type and size of gates shall be as shown on the Drawings.

5. Top and bottom rails between posts unless otherwise indicated.

1.4 SUBMITTALS

A. Shop drawings showing the plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates and a schedule of components.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.

1. Fence and gate posts, rails, and fittings.

2. Chain-link fabric, fabric coatings, reinforcements, and attachments.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, and operational clearances.

D. Delegated-Design Submittal: For chain-link fences and gate framework indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Warranty: Sample of special warranty.

F. Operation and Maintenance Data: Submit manufacturer's materials for operation and maintenance of components, mechanisms, operators, or motors.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Supply material in accordance with Chain Link Fence Manufacturer's Institute Product Manual and this Specification.

C. Perform installation in accordance with ASTM F567.

D. Maintain all facilities installed under this Section in proper and safe condition throughout the progress of the work.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to existing improvements and/or proposed construction. Verify dimensions by field measurements. Notify Engineer of any dimensional discrepancies prior to proceeding with the work. Coordinate with Engineer regarding any adjustment or modification.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.

B. Packages shall be labeled with the manufacturer's name.

C. Store fence fabric and accessories in a secure and dry place.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Faulty operation of gate operators and controls.

b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

c. Deterioration of coatings beyond normal weathering.

B. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 GENERAL

A. All posts and rails shall be straight, true to section and of sufficient length for proper installation.

B. Unless otherwise specified, hardware and accessories shall conform to the requirements of ASTM F626 and ASTM A123 or ASTM A153 as applicable for zinc-coating.

2.2 POSTS AND RAILS

A. Extruded steel tube, ASTM F1083 or rolled/welded tube, ASTM F1043, minimal yield strength 50,000 pounds per square inch (psi), hot dipped galvanized.

1. Extruded steel tube: Average zinc coating of 2.0 ounces per square foot (oz/ft^2) interior/exterior, ASTM F1083.

2. Rolled/welded tube: External zinc coating 1.0 oz/ft^2 with a clear polymeric overcoat, Type D interior 90% zinc-rich coating having a minimum thickness of 0.30 mils.

B. Post size per Table 1.

Table 1 – Post and Rail Sizes

Item	Fence Height	Outside Diameter, Inches	F1083 Schedule 40 weight lb/ft	F1043-IC WT-40 weight lb/ft
Line Posts	up to 8 ft.	2.375	3.65	3.12
	8 to 12 ft.	2.875	5.79	4.64
Terminal Posts	up to 8 ft.	2.875	5.79	4.64
	8 to 12 ft.	4.000	9.11	6.56
Rails		1.660	2.27	1.84

C. Truss rod shall be ⅜-inch zinc-coated steel with adjustable turnbuckles or truss tightener.

2.3 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

1. Fabric Height: As indicated on Drawings.

2. Mesh Size: 1.75 inches.

3. Selvage: Knuckled at both selvages (KK).

4. Wire Fabric

a. Zinc-Coated Steel Fabric, 9-gauge, ASTM A817, hot-dip galvanized, ASTM A392 Class 2 – 2.0 oz/ft², coated after weaving (GAW).

1) Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

b. Polymer-Coated Steel Fabric: ASTM F668, 9-gauge core wire, 0.3 oz/ft^2 zinc-coated with Class 2b (thermally fused and bonded) PVC coating.

1) Color: Black, ASTM F934.

2.4 TENSION WIRE

A. Match coating type to that of the chain link fabric.

1. Metallic-coated steel wire: Marcelled (spiraled or crimped), 7 gage, (0.177 inches) diameter, ASTM A824, zinc-coated, ASTM A817 Class 5 – 2.0 oz/ft².

2. Polymer-coated steel wire: Marcelled (spiraled or crimped) 7 gage, (0.177 inches) diameter (before coating), ASTM F1664.

a. Color: Black, ASTM F934.

2.5 HARDWARE AND FITTINGS

A. Tension and Brace Bands: Galvanized pressed steel complying with ASTM F626, minimum steel thickness of 12 gauge (0.105 in.), minimum width of ¾ in. and minimum zinc coating of 1.20 oz/ft². Secure bands with 5⁄16 in. hot-dip galvanized steel carriage bolts.

B. Terminal Post Caps, Line Post Loop Caps, Rail and Brace Ends, Boulevard Clamps, and Rail Sleeves: In compliance to ASTM F626, pressed steel galvanized after fabrication having a minimum zinc coating of 1.20 oz/ft².

1. Rail sleeves shall not be less than 6 inches long.

C. Truss Rod Assembly: In compliance with ASTM F626, ⅜ in. diameter steel truss rod with a pressed steel tightener, minimum zinc coating of 1.2 oz/ft², assembly capable of withstanding a tension of 2,000 lbs.

D. Tension Bars: In compliance with ASTM F626. Galvanized steel one-piece length 2 in. less than the fabric height, minimum cross section of 3⁄16 in. by ¾ in. and minimum zinc coating of 1.2 oz./ft².

E. Miscellaneous hardware, including but not limited to nuts, bolts, washers, clips, bands, rail ends, brackets, and straps shall be provided as required, hot-dip galvanized steel, ASTM F626.

F. Brace bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.108 inches and a minimum width of ¾ inch.

G. Polymer-Coated Fittings: ASTM F626, PVC or polyolefin coating, minimum thickness 0.006 in., fused and adhered to the zinc-coated fittings. Color to match fence system.

2.6 TIE WIRE AND HOG RINGS

A. Tie Wire and Hog Rings: Galvanized minimum zinc coating 1.20 oz/ft², 9-gauge (0.148 in) steel wire, ASTM F626.

B. Polymer coated materials shall match the coating, class and color to that of the chain link fabric.

2.7 FASTENERS

A. All fasteners shall be hot-dip galvanized, ASTM F2329.

B. Bolts: Steel, ASTM A307, Grade A min, Hex.

C. Nuts: Steel, ASTM A563, Grade A min, Hex.

D. Washers: Steel, round, ASTM F844.

E. Polymer Coated Color Fittings: In compliance with ASTM F626, PVC or polyolefin coating minimum thickness 0.006 in. fused and adhered to the zinc-coated fittings. Color to match fence system.

2.8 GATES

A. Gate Construction: ASTM F900. Corners welded or assembled with special malleable or pressed-steel fittings and rivets or bolts to provide rigid connections.

B. Pipe and Tubing: Zinc-Coated Steel: Comply with ASTM F1043 and ASTM F1083; protective coating and finish to match fence framing.

C. Posts (Hing Posts): Round tubular steel.

1. Up to 4-foot fencing: 2⅞-inch OD Pipe.

2. Over 4-foot to 6-foot fencing: 4-inch OD Pipe.

3. Over 6-foot to 12-foot fencing: 6.625-inch OD Pipe.

D. Frames and Bracing: Round tubular steel.

1. Framing:

a. 2.375 inch OD Pipe

b. Gate Leaves: Configured with intermediate members and diagonal truss rods or tubular members as necessary to provide rigid construction, free from sag or twist. When width of gate leaf exceeds 10 feet, install mid-distance vertical tubing of the same size and weight as frame members. When either horizontal or vertical bracing is not required, provide truss rods as cross-bracing to prevent sag or twist.

c. Horizontal bid bracing shall be used on all gates.

E. Wire Fencing Fabric: Fabric shall match that of fence, attached securely to frame at intervals not exceeding 15 inches.

F. Hardware:

1. Latches, hinges, stops, keepers and other hardware items shall be furnished as required for proper operation. These elements may not be shown on the Drawings, but shall be supplied and installed as required for a complete gate system.

2. Hinges: 360-degree inward and outward swing. Set screw shall be installed drilled into the steel post to lock each hinge to the gate post and prevent rotation. No-lift-off type. Box type hinges are not acceptable.

3. Latches: permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.

4. Double gates and single gates with leaf width 4 feet and greater shall be equipped with a minimum ½″ drop bar and gate hold-backs.

5. Latches, hinges, stops, keepers and other hardware items shall be furnished as required for proper operation.

2.9 CONCRETE

A. Concrete shall conform to ASTM C94; or pre-packaged concrete mix, ASTM C387. Minimum 28-day compressive strength of 3,000 psi. No air entrainment.

2.10 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3 EXECUTION

3.1 GENERAL

A. Install fence with properly trained crew as shown on the drawings in accordance with ASTM F567.

B. Install all nuts for tension bands and hardware bolts on the side of the fence opposite the fabric.

C. The temporary chain link fence shall be removed at the conclusion of the work.

3.2 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.4 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F567 and more stringent requirements indicated.

1. Install fencing on established boundary lines inside property line.

3.5 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete post footings shall have a plan diameter 12 inches greater than the post diameter. Holes shall be clean and free of loose soil and debris. Concrete shall be placed continuously in one operation and tamped or vibrated for consolidation. Tops of the concrete footings shall be crowned to shed water.

3. Gate post/footings shall be installed a minimum of 42 inches below grade.

4. All corner, end posts, and gate posts shall be braced.

a. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

b. Corner and terminal posts are to be braced horizontally and diagonally. The braces are to extend over one adjacent panel. Changes in line of 30 degrees or more shall be considered as corners.

c. Braces and truss rods shall be securely fastened to posts with appropriate hardware.

d. Pull posts with two braces shall be provided for all heights where changes in horizontal or vertical alignment of ten (10) degrees or more occur.

5. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

a. Concealed Concrete: Top 3 inches below grade as indicated on Drawings to allow covering with surface material.

b. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

c. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches deep and ¾ inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.

D. Line Posts: Space line posts uniformly as indicated on the Drawings. Unless indicated otherwise, spacing shall be 8 feet on-center.

E. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches on-center. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

1. Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches (152 mm) of bottom of fabric and tie to each post with not less than same diameter and type of wire.

G. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Intermediate and Bottom Rails: Install and secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches on-center.

K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches on-center and to braces at 24 inches on-center.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

M. Privacy Slats: Install slats in direction indicated, securely locked in place.

1. Diagonally, for privacy factor of 80 to 85.

N. Fabric:

1. Do not install fabric until concrete post footings have cured seven (7) days. Provide fabric of the height specified. Install fabric on the public side of the fence, with bottom no greater than 2 inches above the ground surface. Fabric shall be pulled taut to prevent sagging and provide a uniform smooth appearance. Fasten fabric to line posts at intervals not exceeding 15 inches with ties as specified.

2. Install tension wire in one continuous length between pull posts, weaved through fence fabric at top. Tension wire shall be applied to provide a wire without visible sag between posts. Fasten fabric to tension wire at intervals not exceeding 24 inches with ties or hog rings as specified.

3. Where it is not practicable to conform the fence to general contour of the ground, as at ditches, channels, etc., the opening beneath the fence shall be enclosed with chain link fabric and sufficiently braced to preclude access, but not to restrict the flow of water.

3.6 GATE INSTALLATION

A. Install gates according to manufacturer’s written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-

resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

B. Provide swing gates at the locations and dimensions shown on the Drawings. Do not install gates until concrete post footings have cured seven (7) days.

C. Gates shall be installed plumb, level, and secure, with full opening without interference. Hardware shall be installed and adjusted for smooth operation and lubricated where necessary.

D. Provide concrete center drop to footing depth and suitable drop rod sleeve at center of double gate openings.

3.7 GROUNDING AND BONDING

A. Fence Grounding: Install at maximum intervals of 1,500 feet except as follows:

B. Fences within 100 feet of buildings, structures, walkways, and roadways: Ground at maximum intervals of 750 feet.

1. Gates and Other Fence Openings: Ground fence on each side of opening.

2. Bond metal gates to gate posts.

3. Coordinate subparagraph below with Drawings in projects where intentional discontinuities are provided in metal fencing conductivity to localize lightning effects to the vicinity of strikes. See Evaluations.

4. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.

D. Plans and details on Electrical Drawings and requirements in Division 26 Sections may revise or illustrate application of requirement below or may require grounding that exceeds minimum requirements in IEEE C2. Fences enclosing electrical substations are often bonded to a station grounding mat.

E. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

F. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location, including the following:

1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.

2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.

G. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

H. Connections: Make connections to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.

2. Make connections with clean, bare metal at points of contact.

3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.

4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

I. Bonding to Lightning Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor complying with NFPA 780.

3.8 FIELD QUALITY CONTROL

A. Grounding-Resistance Testing: Engage a qualified testing agency to perform tests and inspections.

1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance no fewer than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.

2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.

3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

3.9 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

3.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION

SECTION 32 9200

TURF AND GRASS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, equipment, services, and perform all operations necessary to complete the work of this section as indicated within the drawings and specified herein which shall include, but is not limited to, the following:

1. Supplying screened loam.

2. Preparation and spreading of stockpiled topsoil (if available).

3. Fine grading.

4. Fertilizers and additives as necessary.

5. Seeding.

6. Erosion Control Matting.

7. Maintenance including watering.

B. Contractor is responsible for all health and safety.

1.2 QUALITY ASSURANCE

A. The Contractor must be a member in good standing of the Associated Landscape Contractors of America.

B. The Contractor must show previous evidence of having successfully installed and maintained landscape projects of similar scope to the subject project with regard to quantities of seeding involved, complexity and a minimum of five (5) years experience on projects similar to this one. The Owner's Representative shall have the right to review the qualifications and references of the Contractor for approval to work on this project.

C. Source Quality Control:

1. Analysis and standards: Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

D. Within 30 days after award of Contract and before any seeding materials are delivered to the job site, submit to the Owner a complete list of all seeding and other items proposed to be installed. At least 10 days prior to shipment delivery of materials, the Contractor shall submit to the Owner a one (1) cubic foot representative sample, certifications, certified test results for materials as specified below. The Contractor shall provide a listing of the addresses (locations) identifying the origin of the soil to be delivered. If the origin is from multiple locations, test results must be provided for each source as well as the blended final product and all locations shall be provided at the time of submission of required information specified above. No material

shall be ordered or delivered until the required submittals have been submitted and approved by the Owner. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Owner reserves the right to reject, on or after delivery, any material that does not meet these specifications.

E. Existing Topsoil from Stockpile may be used providing it can be made to comply with the specifications for screened loam. The Contractor shall provide representative samples for testing and approval. Two (2) test samples of shall be taken and analyzed from each potential loam borrow pit and two each shall be taken and analyzed of existing topsoil stockpiled on site. Site of sample shall comply with testing lab requirements. Contractor shall deliver samples to testing laboratory, have testing report sent directly to the Owner's Representative and pay all costs. Report shall be submitted at least one (1) month before any loaming is to be done.

1. Mechanical and chemical analysis shall be by a public extension service agency or a certified private testing laboratory in accordance with the current "Standards" of the Association of Official Agriculture Chemists and acceptable to the Landscape Architect.

2. Soil test report shall include a mechanical sieve analysis with soil classification. Organic content shall be reported. Chemical analysis shall include pH (1:1 soil-water ratio), buffer pH, Soluble Salts (1:2 soil-water ratio), Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Manganese, Ferric Iron and Sulfate.

3. Test report shall clearly recommend appropriate additives including limestone and fertilizer requirements.

1.3 RELATED SECTIONS

A. Section 31 2313—SUBGRADE PREPARATION

1.4 SUBMITTALS

A. Submit the following under provisions of Section 01 3300—SUBMITTAL PROCEDURES:

1. Sod—statement of composition percentages of purity and germination of each variety.

2. Soil analysis in accordance with the current "Standards of the Association of OFFICIAL Agricultural Chemists".

3. Provide watering and fertilizing schedule to Landscape Architect for approval.

4. Provide two marked up prints to the Landscape Architect indicating square footages for all lawn areas with quantities of all soil additives and sod for each area prior to beginning work.

1.5 PROJECT CONDITIONS

A. All areas to be seeded shall be inspected by the Contractor before starting work and any defects, such as incorrect grading, etc., shall be reported to the Landscape Architect prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be seeded, and he shall assume full responsibility for the work of this Section.

1.6 REFERENCES

A. The work shall conform to the codes and standards of the following agencies, publications as further cited herein:

B. AAN: American Association of Nurserymen, Inc., “Standards for Nursery Stock” ANSI Z60.1—1980, or current edition.

C. ASTM: ASTM International (ASTM), 1916 Race Street, Philadelphia, Pennsylvania, 19103, USA as Published in “Compilation of ASTM Standards in Building Codes”.

D. BHCU: Bailey Hortorium of Cornell University, 1976, Hortus Third, A Concise Dictionary of Plants Cultivated in the United States and Canada (for nomenclature).

E. NAA: National Arborist Association, 3537 Stratford Road, Wantagh, New York, 11793, USA, as published in “Standards for Pruning Shade Trees...”, 1979, or latest edition (for pruning standards).

F. USDA: United States Department of Agriculture, 1941 Yearbook, “Climate and Man” (for average last frost date at locality).

1.7 QUALITY CONTROL/QUALIFICATIONS

A. Provide affidavits from manufacturers major suppliers where required by these Specifications.

B. Fine grading and installation of sod shall be done under the supervision of a qualified foreman acceptable to the Landscape Architect.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver all items to the site in their original containers with all labels intact and legible at time of Owner’s inspection.

B. Immediately remove from the site all seeding materials, which are not true to name, and all materials, which do not comply with the provisions of this Section of these Specifications.

C. Use all means necessary to protect seeding materials before, during, and after installation and to protect the installed work and materials of all other trades.

D. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

PART 2 PRODUCTS

2.1 SCREENED LOAM

A. Screened Loam shall be “coarse sandy loam” determined by mechanical analysis (ASTM D422) and based on the “USDA” Classification System”. Screened Loam has the following mechanical analysis:

Textural Class	Percentage of Total Weight	Average Percentage
Sand (0.05–2.0 mm dia. range)	45–75	60
Silt (0.002–0.05 mm dia. range)	15–35	25
Clay (Less than 0.002 mm dia. range)	5–20	15

Coarse Sandy loam shall have: less than 30% fine/very fine sand, and 50% or more medium/coarse/very coarse sand.

B. Screened Loam shall be a natural product consisting primarily of natural topsoil, free from subsoil, and obtained from an area which has never been stripped, as noted above, the location of the source of the Loam must be submitted to the Landscape Architect. Screened Loam shall not contain less than 3 percent nor more than 10 percent organic matter as determined by the loss on ignition of oven-dried samples, at 100°C ± 5°C. To adjust organic matter content, the soil may be amended, prior to site delivery, by the addition of composted leaf mold or peat moss. Use of organic amendments is accepted only if random soil sampling indicates a through incorporation of these materials. No mixing or amending of Loam will be permitted on site. The Loam shall not be delivered when in a wet or frozen condition.

C. Screened Loam shall consist of fertile, friable, natural loam capable of sustaining vigorous plant growth. Loam shall be without admixture of subsoil, and refuse, resulting in a homogeneous material free of stones greater than ½″ in the longest dimension, be free of lumps, plants, glass, roots, sticks, excessive stone content, debris, and extraneous matter. Screened Loam shall fall within the pH range of 6.0 to 6.5 except as where noted on plans and details. It shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. The maximum soluble salt index shall be 100. Screened Loam shall not have levels of aluminum great than 200 parts per million.

D. If limestone is required to amend the screened loam to bring it within a pH range of 6.0 to 6.5 no more than 200 pounds of limestone per 1,000 square feet of loam, incorporated into the soil, or 50 pounds of limestone per 1,000 square feet of loam, surface application, within a single season.

E. The Owner will reject any material delivered to the site that, after post-delivery testing, does not meet these specifications. If the delivered screened loam does not meet the specifications stated in this document the delivered screened loam will be removed by the Contractor at the Contractor’s expense and at the time of rejection.

F. The Contractor shall take representative samples of topsoil from the site and from topsoil to be hauled in and shall submit samples to a Soil Testing Laboratory for chemical analysis, and physical analysis. The Contractor shall indicate to the testing agencies that turf is to be planted and who the Owner is. The Contractor shall forward to the Owner two copies of analysis and recommendations of the testing agencies.

G. Topsoil, which has been stockpiled on the site, may be used provided it can be made to comply with these Specifications herein for screened loam.

H. All loam provided from off-site sources shall be brought to the site meeting all specification requirements. There must be no mixing or amending of soil on site. No loam shall be spread prior to screening. The loam must not be handled or moved when in a wet or frozen condition.

I. To assure loam borrow purchased and topsoil stockpiled fulfills specified requirements regarding textural analysis, organic matter content, and pH, soil testing results will be obtained by the Contractor and submitted to the Owner's Representative for approval one (1) month before any soil is delivered to the site.

2.2 SOIL ADDITIVES

A. Sand shall be clean sand, free of deleterious materials. Sand shall meet AASHTO M-6 or ASTM C33 with grain size of 0.02″–0.04″.

B. Commercial fertilizer, peat, humus or other additives shall be used to counteract soil deficiencies as recommended by the soil analysis and as directed by the Owner's Representative.

C. If stored at the site, protect fertilizer from the elements at all times.

D. Fertilizer shall be commercial fertilizer, based upon soil tests. Fertilizer mixture containing at least sixty percent (60%) of organic material.

1. Percentages of nitrogen, phosphorous and potash shall be based on laboratory test recommendations as approved by the Landscape Architect. For purpose of bidding, assume ten percent (1 0%) nitrogen, twenty percent (20%) phosphorus and six percent (6%) potash by weight. At least fifty percent (50%) of the total nitrogen shall contain no less than three percent (3%) water-insoluble nitrogen.

2. Fertilizer shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear the manufacturer's guaranteed statement of analysis, or a manufacturer's certificate of compliance covering analysis shall be furnished to the Landscape Architect. Store fertilizer in a weatherproof place and in such a manner that it will be kept dry and its effectiveness will not be impaired.

3. Fertilizer shall be applied in two (2) applications. The first application shall be within one (1) week before the sodding at the rate of thirty-five (35) pounds per thousand (1,000) square feet harrowed into the top two (2) inches of sod bed. The second application shall be done as a maintenance application.

4. At least four (4) days shall lapse after the application of lime and fertilizer before sodding shall begin.

E. Humus shall be natural humus, reed peat or sedge peat. It shall be free from excessive amounts of zinc, low in wood content, free from hard lumps and in a shredded or granular form. According to the methods of testing of A.O.A.C., latest edition, the acidity range shall be approximately 5.5 pH to 7.5 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.

F. Manure shall be well-rotted, unbleached stable manure not less than eight months and not more than two years old. It shall be free from sawdust, shavings or refuse of any kind and shall not contain over twenty-five (25) percent straw. The Contractor shall furnish information as to the kind of disinfectant or chemicals, if any, that may have been used in storage of the manure.

G. Lime: Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 85 percent of total

carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

H. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 18% available phosphoric acid. Superphosphate shall be applied with the fertilizer at the rate of twenty (20) pounds per thousand (1,000) square feet. At least four (4) days shall lapse after the application of lime and fertilizer before sodding shall begin.

I. Aluminum Sulfate: Commercial grade.

J. Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.

K. Water: The Contractor shall be responsible for furnishing his own supply of water to the site at no extra cost. If possible, the Owner will furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owners water supply is not available or not functioning, the Contractor will be held responsible to furnish water.

1. Water shall be free from impurities injurious to vegetation.

2.3 SEED

A. Lawn Areas

1. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall weed seed content exceed 1% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturers Certificate of Compliance. Seed that has become wet, moldy or otherwise damaged will not be acceptable.

a. Manufacturer: The Chas. C. Hart Seed Co. Evergreen mixture or an equivalent seed blend to the following:

1) 50% Creeping Red Fescue

2) 30% Rogue Intermediate Ryegrass

3) 20% Kentucky Bluegrass

2. Seed mixture to be applied at the following rate:

a. Five (5) pounds per 1,000 square feet.

3. Seed shall be mixed by a dealer.

2.4 EROSION CONTROL MATTING

A. Shall be on all slopes 2:1 and greater in slope.

B. Jute mesh shall be a uniform, open, plain weave cloth of undyed and unbleached single jute yarn. The yarn shall be of a loosely twisted construction and it shall not vary in thickness more than one-half its normal diameter. Jute mesh shall be furnished in rolled strips and shall meet the following requirements:

Width—48 inches, plus or minus one inch
78 warp—ends per width of cloth (minimum)
41 weft—ends per yard (minimum)
Weight shall average 1.22 pounds per linear yard with a tolerance of plus or minus 5%.

C. Staples shall be U-shaped and shall be approximately six inches long and one inch wide. Machine made staples shall be of No. 11 gauge or heavier steel wire. Handmade staples shall be made from 12-inch lengths of No. 9 gauge or heavier steel wire.

PART 3 EXECUTION

3.1 PREPARATION OF PLANTING SOIL

A. Mix specified soil amendments and fertilizers with topsoil and/or loam borrow at rates specified by testing agency. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.

B. Loam, organic material and bonemeal for plant backfill for both planting beds and individual plants shall be thoroughly premixed in the proportions of one (1) part of organic material with seven (7) parts of loam together with ten (10) pounds of bonemeal per cubic yard of mixture.

C. Maintain at all times during the planting operations one or more stockpiles of approved loam borrow or topsoil from stockpile.

3.2 FINE GRADING AND LOAMING

A. After the areas to be loamed have been brought to rough grade, and immediately prior to and after spreading the loam borrow or topsoil, the subgrade shall be loosened by disking or rototilling to a depth of at least three inches to permit bonding of the loam to the subsoil. Remove all stones greater than one (1) inch in diameter and all debris or rubbish. Such material shall be removed from the site, at no additional cost to the Owner.

B. Provide a minimum depth of six (6) inches of planting soil in all areas indicated for seeding and all areas disturbed by excavation and construction operations.

C. Screened loam borrow or screened topsoil from stockpile shall be placed and spread over approved areas to a depth sufficiently greater than six inches so that after natural settlement and light rolling, the completed work will conform to the lines, grades, and elevations indicated. Supply additional loam, after testing and approval as may be needed, to give the specified depths and finished grades under the Contract without additional cost to the Owner.

D. Disturbed areas outside the limit of seeding shall be spread with six (6) inches of screened loam or screened topsoil to the finished grade as specified herein above.

E. No subsoil or loam shall be handled in any way if it is in a wet or frozen condition.

F. Sufficient grade stakes be set for checking the finished grades. Stakes must be set in the bottom of swales and at top of slopes. Grades shall be established which are accurate to one tenth of a foot either way. Connect contours and spot elevations with an even slope.

G. After loam has been spread, it shall be carefully prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, glass, roots, stumps, litter and other foreign matter, and stones over one inch in diameter shall be removed from the loam. Loam shall also be free of smaller stones in excessive quantities as determined by the Owner’s Representative.

H. The whole surface shall then be rolled with a hand roller weighing not more than 100 pounds per foot of width. During the rolling, all depressions caused by settlements or rolling shall be filled with additional loam and the surface shall be regraded and rolled until it presents a smooth and even finish to the required grade.

I. Contractor shall obtain Owner's Representatives written approval of fine grading and bed preparation before doing any seeding or sodding.

3.3 SEEDING

A. All areas indicated on the plan shall be loamed and seeded only after written approval of the Owner's Representative of bed preparation. All disturbed areas outside the limit of seeding shall be seeded.

B. Immediately before seeding, the ground shall be restored, as necessary, to a loose friable condition by dicing or other approved method to a depth of not less than 2″. The surface shall be cleared of all debris and of all stones 1″ or more in diameter.

C. Seeding shall be done only during the period from April 1 to May 30 or August 15 to October 15. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. At his option, and on his responsibility, the Contractor may plant seed under unseasonable conditions at no increased cost to the Owner.

D. Seeding of lawns shall be done only by experienced workmen under the supervision of a qualified foreman.

E. Soil additives shall be per the nutrient testing analysis recommendations and thoroughly incorporated into the layer of loam by power raking or other methods approved by the Landscape Architect.

F. Seed only when the bed is in a friable condition, not muddy or hard.

G. Seed all areas to be seeded with specified grass seed, sowing evenly with an approved mechanical seeder at the rate of 5 pounds per 1,000 square feet. Sow 2.5 pounds per 1,000 square feet in one direction and 2.5 pounds per 1,000 square feet at right angles to the first seeding. Spread seed when soil is moist. Cultipacker, or approved similar equipment, may be used to cover the seed and to firm the seedbed in one operation. In areas inaccessible to cultipacker, the seeded ground shall be lightly raked and rolled in two directions with a water ballast roller. Extreme care shall be taken during seeding and raking to insure that no change shall occur in the finished grades and that the seed is not raked from one spot to another. Hydroseeding is an acceptable manner of seeding, providing the Contractor certifies in writing that the hydro-seed fertilizer mix is as herein specified and applied at the equivalent rate of 5 pounds per 1,000 square feet.

H. If covering and rolling is not properly accomplished by the seeding machine, the seed shall be lightly raked into the ground, after which the ground shall be rolled with a five hundred pound roller and thoroughly and evenly watered with a fine spray to penetrate the soil to a depth of at least two (2) inches.

I. Promptly after seeding, wet the seedbed thoroughly, keeping all areas moist throughout the germination period.

J. Mulch shall be placed immediately after seeding. Straw or salt marsh hay that has been thoroughly fluffed shall be spread evenly and uniformly at the rate of two to three tons per acre. Lumps and thick mulch materials shall be thinned. All mulch anchor stakes, strings and matting shall be removed before final acceptance of lawns. In addition, following mulching, all slopes of 3:1 or greater shall be covered with jute, biodegradable tobacco netting or approved equal. Securely stapled in place. Overlap all joints in netting a minimum of 6″.

K. Hydroseed mix: All work shall be installed using an approved spraying machine specifically used for this purpose. Amounts of fertilizer used shall be as the testing agency recommendations prescribe and as directed by the Owner's Representative. The Contractor shall submit to the Owner's Representative for approval prior to the start of any seeding work, a certified statement as to the number of pounds and types of fertilizer, amounts and types of grass seed and processed fiber per one hundred (100) gallons of water.

1. Hydromulch shall be Terra-Sorb GB or approved equal

    a. Add Terra-Sorb to the hydroseed tank at the rate of sixty (60) pounds per acre.

3.4 EROSION CONTROL MATTING

A. Jute mesh shall be placed within 48 hours after finish grading or topsoiling of an area is completed. If seeding is specified, within 24 hours after seeding of an area is completed. The jute mesh shall be placed in a manner that will minimize disturbance of the underlying soil. All equipment and application processes shall be approved by the LANDSCAPE ARCHITECT prior to use.

B. The surface shall be smoothed and all gullies and potholes backfilled prior to applying jute mesh. All rocks or clods larger than two inches in size and all sticks and other foreign material that will prevent contact of the jute mesh with the surface shall be removed. If the surface is extremely dry, the ENNGINEER may require watering prior to placement.

C. Jute mesh shall be placed uniformly, in contact with the underlying soil, at the locations shown on the Drawings or directed by the LANDSCAPE ARCHITECT. The top edge of each strip shall be anchored by placing a tight fold of mesh vertically in a six inch deep slot or trench in the soil and tamping and stapling in place. Edges of adjacent strips shall be lapped six inches with a row of staples at a maximum interval of three feet in the lapped area. Bottom edges shall be lapped 12 inches over the next lower strip, if applicable, or buried as specified for top edges.

D. Check slots shall consist of separate four foot strips of jute mesh placed at right angles to the direction of water flow immediately prior to placing the general covering of jute mesh. Check slots shall be anchored by burying the top edge of the strip as described above.

E. Check slots shall be spaced so that one check slot, or junction slot of the jute mesh occurs every 75 feet on gradients of less than 4% and every 50 feet on gradients of more than four percent. On slope drains, a check slot or an end slot shall occur every 25 feet unless otherwise specified.

F. Edges of jute mesh shall be buried around the edges of catch basins and other structures.

G. Jute mesh shall be held in place by wire staples driven vertically into the soil. The mesh shall be fastened at intervals not more than three feet apart in three rows for each strip of mesh, with one row along each edge and one row alternately spaced in the middle. All ends of the mesh and check slots shall be fastened at six inch intervals across their width.

H. The Contractor shall maintain the areas covered by jute mesh until final acceptance of the project. Prior to final acceptance, any damaged areas shall be reshaped as necessary, reseeded, if applicable; and the jute mesh satisfactorily repaired or replaced.

3.5 MAINTENANCE FOR SEEDED AREAS

A. Maintenance shall begin immediately after any area is seeded and shall continue until final acceptance, but in no case, less than the following period.

1. Sixty (60) days after substantial completion of seeding.

a. Maintenance may continue until the next growing season if in the opinion of the Owner's Representative the season enters a winter dormancy and no maintenance should continue.

b. Seeded lawns shall be maintained until all areas have a close stand of grass which has received a minimum of three mowings, has no bare spots greater than two inches in diameter, and at least 90% of the grass established shall be permanent grass species.

B. Maintenance shall include reseeding, mowing, watering, weeding and fertilizing.

C. Watering of Seeded Areas:

1. First Week: The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of an adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least two inches.

2. Second and Subsequent Weeks: Water seeded areas as necessary to supplement natural rain to the equivalent of one (1) inch rainfall per week The Contractor shall water the lawn as required to maintain adequate moisture, in the upper two inches of soil, necessary for the promotion of deep root growth.

3. Watering shall be done in a manner, which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply one complete coverage to the seeded areas in an eight (8) hour period.

D. Protection:

1. Seeded areas shall be protected by stakes and caution tape or snowfence as directed by the Landscape Architect. Wire shall not be used.

2. Barriers must be raised immediately after seeding and shall be maintained until acceptance.

E. Reseeding: After the grass in seeded areas has appeared, all areas and parts of areas which, in the opinion of the Owner's Representative, fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded and such areas and parts of areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass. Reseeding together with necessary grading, fertilizing, and trimming shall be done at the expense of the Contractor.

F. Mowing:

1. At the time of the first cutting, there shall be a uniform stand between 3″ and 3½″ high, and mower blades shall be set between 2½″ and 3″ high.

2. Mowing shall include removal of clippings.

G. Fertilizing: A second application of fertilizer, as specified herein, shall be applied after one (1) season of growth of a minimum of two (2) months duration, but only during the months of April, May, August or September. Fertilizer shall be applied at the rate of thirty (30) pounds per one thousand (1,000) square feet.

H. Liming: If more than one initial application of limestone is required by the soils analysis to bring the pH of the stockpiled topsoil/loam borrow to a specified range, the Contractor shall be responsible for all additional required lime applications.

3.6 CLEANUP AND PROTECTION

A. During seeding work, keep pavements clean and work area in an orderly condition.

B. Protect seeding work and materials from damage due to landscape operations, operations by other Contractors or trades, and trespassers.

1. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.7 ACCEPTANCE

A. The Owner shall inspect all work for Acceptance upon written request of the Contractor. The request shall be received at least 10 calendar days before the anticipated date of inspection. Upon completion and re-inspection of all repairs or renewals necessary in the judgment of the Owner, he shall certify in writing to the Contractor as to the Acceptance of the work.

3.8 ACCEPTANCE IN PART

A. The work may be accepted in parts when it is deemed to be in the Owner's best interest to do so and when approval is given to the Contractor in writing to complete the work in parts. Acceptance and use of such areas by the Owner shall not waive any other provisions of this Contract.

3.9 CLEANUP

A. When any of this work is done while buildings are occupied, pavements shall be kept clear at all times, broom cleaned to prevent tracking dirt into buildings.

B. After completion of all planting operations, dispose of all debris and excess material to the satisfaction of the Owner. All pavements shall be swept and hosed clean.

3.10 FINAL INSPECTION AND ACCEPTANCE

A. At the end of the guarantee period, the Owner will inspect all guaranteed work for the Final Acceptance upon written request of the Contractor. The request shall be received at least 10 calendar days before the anticipated date for final inspection.

B. Upon completion and re-inspection of all repairs or renewals necessary in the judgment of the Owner at that time, he shall certify in writing to the Contractor as to the Final Acceptance of the project.

END OF SECTION

SECTION 33 4000

STORM DRAINAGE SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Installation of new storm drain pipe, manholes and catch basins.

2. Relocation and/or replacement of existing storm drain pipe and catch basins.

3. Connection of exterior building roof drains and perimeter drains.

4. Installation of under-drains.

5. Installation of stormwater treatment units.

B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work.

C. Contractor is responsible for all health and safety.

D. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied. Notify and obtain such permits or approvals from all agencies having jurisdiction prior to starting work.

1.2 REFERENCE STANDARDS

A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

B. Code of Federal Regulations (CFR)

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. ASTM International (ASTM)

1. ASTM A36—Standard Specification for Carbon Structural Steel.

2. ASTM A48—Standard Specification for Gray Iron Castings.

3. ASTM A123—Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

4. ASTM A307—Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

5. ASTM A536—Standard Specification for Ductile Iron Castings.

6. ASTM A615—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

7. ASTM C12—Standard Practice for Installing Vitrified Clay Pipe Lines.
8. ASTM C14—Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
9. ASTM C55—Standard Specification for Concrete Building Brick.
10. ASTM C76—Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
11. ASTM C94—Standard Specification for Ready-Mixed Concrete.
12. ASTM C139—Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
13. ASTM C150—Standard Specification for Portland Cement.
14. ASTM C207—Standard Specification for Hydrated Lime for Masonry Purposes.
15. ASTM C270—Standard Specification for Mortar for Unit Masonry.
16. ASTM C387—Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
17. ASTM C425—Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
18. ASTM C443—Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
19. ASTM C443—Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
20. ASTM C478—Standard Specification for Precast Reinforced Concrete Manhole Sections.
21. ASTM F493—Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
22. ASTM C507—Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe.
23. ASTM C564—Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
24. ASTM F656—Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
25. ASTM C700—Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.
26. ASTM C877—Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections.
27. ASTM C890—Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

28. ASTM C913—Standard Specification for Precast Concrete Water and Wastewater Structures.

29. ASTM C923—Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

30. ASTM C990—Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants.

31. ASTM C1479—Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations

32. ASTM C 1628—Standard Specification for Joints for Concrete Gravity Flow Sewer Pipe, Using Rubber Gaskets.

33. ASTM D1784—Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

34. ASTM D1785—Standard Specification for Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120.

35. ASTM D2235—Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

36. ASTM D2241—Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

37. ASTM D2321—Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

38. ASTM D2412—Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

39. ASTM D2466—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

40. ASTM D2467—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

41. ASTM D2564—Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

42. ASTM D2855—Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.

43. ASTM D2665—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.

44. ASTM D2729—Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

45. ASTM D2855—Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

46. ASTM D3212—Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

47. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

48. ASTM D4396—Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications.

49. ASTM F402—Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings.

50. ASTM F405—Corrugated Polyethylene (PE) Tubing and Fittings.

51. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

52. ASTM F656—Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

53. ASTM F679—Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.

54. ASTM F714—Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

55. ASTM F758—Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage.

56. ASTM F894—Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe.

57. ASTM F1803—Standard Specification for Poly (Vinyl Chloride)(PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter.

58. ASTM F2306—Standard Specification for 12 to 60 inch [300 to 1500 mm] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.

59. ASTM F2648—Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications.

D. American Concrete Pipe Association (ACPA).

1. ACPA 01-103—Concrete Pipe and Box Culvert Installation (latest revision and applicable supplements thereto).

E. American Association of State High and Transportation Officials (AASHTO).

1. AASHTO H20—Standard Specifications for HS-20, Highway Loading.

2. AASHTO M105—Standard Specification for Gray Iron Castings.

3. AASHTO M198—Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets.

4. AASHTO M252—Standard Specification for Corrugated Polyethylene Drainage Pipe.

5. AASHTO M294—Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter.

F. Corrugated Polyethylene Pipe Association (CPPA), division of the Plastics Pipe Institute (PPI).

1. Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings (latest revision and applicable supplements thereto).

G. State of Connecticut Department of Transportation (ConnDOT)

1. Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction, Form 817, 2016 and any supplements.

1.3 SUBMITTALS

A. Shop Drawings:

1. Submit shop drawings, descriptive literature, or both, showing pipe materials and appurtenances to be furnished. Shop drawings shall be submitted to Engineer for approval prior to ordering materials.

2. Shop drawings showing the configuration, dimensions, layout, and spacing of major and minor components such as pipe, joints, couplings, restraints, and other proposed details of assembly. Show in large-scale details any unique assembly, pipe/pipe transitions, pipe/structure transitions, and/or installation requirements.

B. Copies of manufacturer-provided installation instructions, operation instructions, and maintenance material for all equipment furnished under this Section.

C. Manufacturer’s warranties and associated warranty registration data in Owner’s name. Submit two (2) copies of each warranty to Engineer in the manufacture/supplier standard form or if there is no standard form available, in a form specified by Engineer.

D. As-Built Drawings.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.

B. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.

C. Sample pipe for testing, when requested by Engineer, shall be furnished by Contractor in sufficient numbers. The Contractor and/or the pipe manufacturer shall make the facilities and services for making the load tests available.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage

1. Manufacturer shall package the pipe and other drainage materials in a manner designed to deliver the pipe to the Project Site neatly, intact, and without physical damage. Transportation carrier shall use an appropriate method to ensure the pipe is properly supported, stacked, and restrained during transport. Inspect materials delivered to site for damage; store with minimum of handling.

2. Unloading of the pipe and other drainage materials should be controlled so as not to collide with the other pipe sections or fittings, and care should be taken to avoid chipping or spalling, especially to the spigots and bells. For manhole sections, cone sections, bases, fittings and other precast appurtenances, utilize lifting holes or lifting eyes provided.

3. In cold weather conditions, use caution to prevent impact damage. Handling methods considered acceptable for warm weather may be unacceptable during cold weather.

4. Storage:

a. Store materials on site in enclosures or under protective coverings. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

b. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging.

c. Store solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials under cover out of direct sunlight. Provide additional storage measures in accordance with the manufacturer’s recommendations. Discard materials if storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

d. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

e. Cement, Aggregate, and Reinforcement: As specified in Section 033200—Site Cast-in-Place Concrete.

f. Store manhole units in an upright position.

PART 2 MATERIALS

2.1 GENERAL

A. Products furnished under this Section which are damaged or found defective in any way prior to being set in place and final acceptance, may be rejected. Engineer may reject an entire lot of pipe should the sample pipe from such lot fail to meet requirements.

2.2 CONCRETE GRAVITY PIPE

A. Reinforced concrete pipe:

1. Pipe less than 12 inches in diameter: ASTM C14, Class 3.

2. Pipe greater than 12 inches in diameter: ASTM C76, Class 3.

3. Class 4 pipe shall be required when cover is less than 12 inches.

B. Fittings and specials: conform to the applicable requirements specified for the pipe.

C. Gaskets and pipe ends for rubber gasket joint: ASTM C443.

2.3 CORRUGATED POLYETHYLENE PIPE

A. Pipe: High density polyethylene, corrugated, smooth interior, ASTM D3350, Cell Classification 424420C.

1. Four (4) inch through 10 inch diameter pipe: AASHTO M252, Type S.

2. 12 inch through 60 inch diameter pipe: AASHTO M294, Type S or ASTM F2306.

B. Joints: Bell-and-spigot joint, AASHTO M252, AASHTO M294, or ASTM F2306. Bell shall be an integral part of the pipe and provide a minimum pull-apart strength of 400 pounds. Bell-and-spigot joint shall incorporate a gasket making it silt-tight. Gaskets shall be installed in the bell, or on the pipe by the pipe manufacturer.

1. Four-inch (4″) through 60-inch (60″) diameter pipe joint, watertight, ASTM D3212. Gaskets: polyisoprene, ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.

2. 12-inch (12″) through 60-inch (60″) diameter pipe shall have a reinforced bell with a bell tolerance device. The bell tolerance device shall be installed by the manufacturer.

3. Coupling bands shall conform to the manufacturer’s specifications. Couplers shall cover not less than one corrugation on each section of pipe.

C. Fittings: AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the watertight joint performance requirements of AASHTO M252, AASHTO M294 or ASTM F2306.

D. Saddle Tee

1. Saddle tees shall be manufactured saddle tees designed to connect to the corrugated polyethylene pipe.

2. Fittings shall conform to AASHTO M 294. Fabricated fittings shall be welded on the interior and exterior of all junctions.

3. A soil-tight seal shall be obtained with the coupling at the saddle tee stub to the storm service pipe.

2.4 POLYVINYL CHLORIDE (PVC) GRAVITY PIPE

A. Polyvinyl Chloride Pipe formulated for drainage application:

1. Pipe 4-inch to 15-inch diameter: ASTM D3034, SDR-35. Elastomeric gasket joints, retained gaskets, part of a complete pipe section and supplied as such.

2. Pipe 18 inch to 36 inch diameter: ASTM F679. Elastomeric gasket joints, retained gaskets, part of a complete pipe section and supplied as such.

B. PVC Cell classification: 12454 or 12364, ASTM D1784.

C. Pipe shall have a minimum pipe stiffness that equals or exceeds 46 psi (lbs/in.^{2}).

D. Pipe shall be marked along the outside of the barrel with the following:

1. The manufacturer's name or trademark.

2. The standard to which it conforms/ASTM Designation.

3. Pipe size.

4. Material designation code/PVC cell classification.

5. SDR number or schedule number.

E. Standard length of pipe: maximum of 20 feet with the following exceptions.

1. Length of 6-inch pipe shall be a maximum of 13 feet unless otherwise approved by Engineer.

2. Pipe used in house connections and/or laterals shall not exceed 6.5 feet in length unless otherwise approved by Engineer.

F. PVC Plastic Gravity Joints and Jointing Material.

1. Joints: ASTM D3213, gasketed, bell-and-spigot, push-on type.

2. Gaskets: ASTM F477. Since each pipe manufacturer has a different design for push-on joints, gaskets shall be part of a complete pipe section and provided as such. Gaskets may be factory installed or field installed as recommended by the pipe manufacturer. Lubricant shall be as recommended by the pipe manufacturer.

G. Fittings: SDR-35, ASTM D3034 and ASTM F1336, specifications as pipe.

H. The manufacturer shall provide waterstops acceptable to Engineer, which shall be applied to the outside of the plastic pipe where the pipe is to be enclosed in any structure where concrete or mortar is used to prevent leakage along the outer wall of the barrel of the pipe.

I. No single piece of pipe shall be laid on any project covered by these specifications unless it is found to be generally straight. Such pipe shall have a maximum ordinate as measured from the concave side of the pipe not to exceed 1/16 inch per foot of length. If the deviation from straightness exceeds this requirement, then the particular piece of pipe shall be rejected.

2.5 JOINT LUBRICANT

A. As specified by pipe manufacturer, ANSI/AWWA C111/A21.11.

2.6 MASONRY UNITS

A. Brick: ASTM C32 Grade MS or ASTM C62 Grade SW.

B. Concrete block: Solid block, ASTM C139.

2.7 MORTAR

A. Mortar: ASTM C387.

1. Portland Cement: ASTM C150, Type I.

2. Sand: ASTM C144.

3. Hydrated Lime: ASTM C207.

4. Water: Potable.

5. Mix proportions for manhole rims and covers: 1 part portland cement, 2 parts sand, and ¼ part hydrated lime by dry volume. Hydrated lime shall not exceed 10 percent by weight of the total dry mix. Quantity of water in mixture shall be sufficient to produce a stiff, workable mortar, but in no case shall exceed 5½ gallons of water per sack of cement.

6. Mix Proportions for invert construction: 1 part portland cement and 2 parts sand by volume. Quantity of water in mixture shall be sufficient to produce a stiff, workable mortar, but in no case shall exceed 5½ gallons of water per sack of cement.

2.8 BEDDING

A. Bedding for concrete and PVC pipes: Bedding, Haunching and Initial Backfill shall consist of screened gravel, maximum size ¾ inches and minimum size ⅜ inches.

B. Bedding for HDPE pipes: Bedding, Haunching and Initial Backfill shall consist of ConnDOT No. 6, No. 67, or No. 8 aggregate, or other materials meeting the requirements of ASTM D2321 for Class IA, Class IB, Class II, or Class III unless otherwise specified by the pipe manufacturer.

PART 3 EXECUTION

3.1 PIPE INSTALLATION

A. As soon as the excavation is completed to the normal grade of the bottom of the trench, the Contractor shall immediately place the bedding material in the trench. Then the pipe shall be firmly bedded in the compacted bedding material to conform accurately to the lines and grade indicated on the Drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer’s instructions.

1. Concrete pipe shall be installed per ASTM C1479, as may be modified by the pipe manufacturer’s instructions.

2. HDPE pipe shall be installed per ASTM D2321, as may be modified by the pipe manufacturer’s instructions.

C. Notch under pipe bells and joints, where applicable to provide for uniform bearing under entire length of pipe.

D. Excavation, backfilling and compaction shall be as specified in Section 312310—Earthwork of these Specifications.

E. Maintain optimum moisture content of bedding material to attain required compaction density.

3.2 BRICK MASONRY

A. Brick Masonry Construction shall be done in a manner to insure watertight construction and all leaks in brick masonry shall be sealed. All workmanship shall conform to the best standard practice and all brick masonry shall be laid by skilled workmen.

B. All beds on which masonry is to be laid shall be cleaned and wetted properly. Brick shall be wetted as required and shall be damp but free of any surface water when placed in the Work. Bed joints shall be formed of a thick layer of mortar, which shall be smoothed or furrowed slightly. Head joints shall be formed by applying to the brick to be laid a full coast of mortar on the entire end, or on the entire side as the case requires, and then shoving the mortar covered end or side of the brick tightly against the bricks laid previously. The practice of buttering at the corners of the brick and then throwing the mortar or crappings in the empty joints will not be permitted. Dry or butt joints will not be permitted. Joints shall be uniform in thickness and shall be approximately 1¼ inch thick.

C. Brickwork shall be constructed accurately to dimensions and brickwork at top of manholes shall be to the dimensions of the flanges of the cast-iron frames.

D. Joints on the inside face of walls shall be tooled slightly concave with an approved jointer when the mortar is thumbprint hard. The mortar shall be compressed with complete contact along the edges to seal the surface of the joints.

E. All castings to be embedded in the brickwork shall be accurately set and built-in as the Work progresses. Cast-iron frames and manhole covers shall be well bedded in mortar and accurately set to finished graded indicated or as directed.

F. Water shall not be allowed to flow against brickwork or to rise on the masonry for 60 hours after it has been laid, and any brick masonry damaged in this manner shall be replaced as directed at no additional expense to the Owner. Adequate precautions shall be taken in freezing weather to protect the masonry from damage by frost.

3.3 CONCRETE MASONRY UNITS

A. Concrete Masonry unit construction shall be soaked in water before laying. As circular concrete block walls are laid-up, the horizontal joints and keyways shall be flushed full with mortar. As rectangular blocks are laid-up, all horizontal and vertical joints shall be flushed full with mortar. Plastering of the outside of block structures will not be required. The joints in precast units shall be wetted and completely mortared immediately prior to setting a section. No structure shall be backfilled until all mortar has completely set.

3.4 CASTINGS

A. Cast-iron frames for grates and covers shall be well bedded in cement mortar and accurately set to the grades indicated or as directed. The frames shall be encased with a thick cement-mortar collar around the entire perimeter of the frames.

B. All voids between the bottom flange shall be completely filled to make a watertight fit. A ring of mortar, at least one inch thick and pitched to shed water away from the frame shall be placed over and around the outside of the bottom flange. The mortar shall extend to the outer edge of

the masonry all around its circumference and shall be finished smooth. No visible leakage will be permitted.

C. Structures within the limits of bituminous concrete pavement shall be temporarily set at the elevation of the bottom of the binder course or as ordered. After the binder course has been compacted, these structures shall be set at their final grade. Backfill necessary around such structures after the binder course has been completed shall be made with Class A concrete unless otherwise ordered.

3.5 CLEANING

A. At the completion of the Work, clean all piping, structures and open drainage courses, through and to which water from this construction is directed, to the satisfaction of Engineer.

3.6 AS-BUILT DRAWINGS

A. Contractor shall be solely responsible for complying with the requirements of local permitting authorities for preparation and submittal of as-built drawings. The requirements for the preparation of as-built drawings as defined herein shall be considered the minimum requirements of Engineer, but shall in no way relive Contractor from satisfying the requirements of local permitting authorities.

B. As work progresses, record the following on two (2) sets of Drawings:

1. All changes and deviations from the design in location, grade, size, material, or other feature as appropriate.

2. Any uncharted locations of utilities or other subsurface feature encountered during installation, including the characteristics of such uncharted utility or subsurface feature such as utility type, size, depth, material of construction, etc.

C. Recording of changes shall be clearly and neatly marked in red pen or pencil. All changes shall be noted on the appropriate Drawing sheets.

D. Make measurements from fixed, permanent points on the Project Site to accurately locate the work completed. Such measurements shall consist of at least three (3) ties showing the distance of each item relative to each of the fixed, permanent points.

E. As-Built drawings shall be complete and shall indicate the true measurement and location, horizontal and vertical, of all new construction. As-Built drawings shall also contain any additional information required by Engineer.

END OF SECTION

END PROJECT MANUAL