Invitation to Bid
ITB: #2022-005

Stonington Recreation Department
Spellman Park Tennis Court Renovation Project

Issue Date: May 4, 2022
<u>Bid Deadline: May 26, 2022 @ 2:00pm</u>

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TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

May 4, 2022

Sealed Bids for the Reconstruction of the Town of Stonington Tennis Courts, located at Spellman Drive, Pawcatuck CT, will be received by Mr. James Sullivan at the Stonington Town Hall, 3rd Floor Finance Office, 152 Elm Street, Stonington, Connecticut 06378, until **2:00 pm local time on May 26, 2022** at which time the Bids received will be opened publicly, and read aloud. Bids submitted after this time will not be accepted. The Project is located at Spellman Drive, Pawcatuck, CT. The Work is estimated to cost in excess of $100,000 and therefore **will** require State of Connecticut Prevailing Wage Rates for onsite labor. Each bidder must submit a sealed envelope, the outside of which must be clearly marked **"BID#2021-008 ENCLOSED – Spellman Park Tennis Court Renovation," and include the bidder's company name and address.**

The full Invitation to Bid, and bidding documents, may be obtained on the Town's website, under http://www.stonington-ct.gov/bids-rfps or on the CT DAS contracting portal.

Note: Once awarded, work under this bid shall start no sooner than September 1, 2022, and be substantially completed no later than May 15, 2023.

Any addenda to the ITB will be posted to the Town's website along with the CT DAS contracting portal. All firms are responsible for checking for new addenda.

Any questions regarding this bid should be emailed to Eric Roise at Kaestle Boos Associates, Inc., Architects, at eroise@kba-architects.com no later than **3:00 PM on Friday May 20, 2022**.

Bids shall be on a lump sum basis. Bids will be compared and evaluated and awarded on the basis of the Total Bid to the lowest responsible and qualified bidder.

Pre-bid conference: Non-Mandatory Pre-bid conference and walk-through will be held on Wednesday May 18, 2022 at 3:00 pm at the Spellman Park Tennis Courts, Spellman Drive, Pawcatuck, CT. The project site will be available for viewing at that time. Eligible bidders are encouraged to attend and observe existing conditions prior to submitting a bid.

The successful Bidder is required to comply with all provisions of the Civil Rights Act of 1964, the Equal Opportunity Act of 1972, Executive Orders #3, No. 17, 11246, 11375 and 11478. Contractors shall comply with State Statutes concerning Employment and Labor Practices, if applicable, and Section 31-53 of the Connecticut Statutes, as amended (Prevailing Wages).

The Town of Stonington and its Agencies and Commissions is an Affirmative Action/Equal Opportunity employer. Respondents must ensure that employees and applicants for employment

are not discriminated against because of their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, genetic information, veteran status intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Respondent that such disability prevents performance of the work involved. The Town of Stonington complies with all Federal, State, and Local laws governing nondiscrimination in employment in every location in the Town has facilities. This policy applies to all terms and conditions of employment, including recruiting, hiring, placement, promotion, termination, layoff, recall, transfer, leaves of absence, compensation and training. Respondents to this ITB agree and warrant that in the performance of the work contemplated under this ITB they will not discriminate or permit discrimination against any person or group of persons. Respondents agree to provide the State of Connecticut Commission on Human Rights and Opportunities with such information requested by the Commission concerning employment practices and procedures.

A completed Bid Form and attachments listed therein must be submitted with the Bid. Bid security shall be furnished in accordance with the Instructions to Bidders. The Bid Security shall be a proposal guaranty bond made in favor of the Town executed by a surety company authorized to do business in the State of Connecticut. Bid Security shall be made payable to Town of Stonington, Connecticut. Bids submitted without Bid Security will not be considered. No Bid may be withdrawn for 60 days after receipt of Bids unless released by the Owner.

Any bidder that qualifies for the "LOCAL VENDOR PREFERENCE" must fill out a "Town- Based Business Affidavit Form" signed by an authorized representative of the bidder at the time of bid submittal in order to be considered for this preference. Failure to submit a Town Based Business Affidavit on the form provided by the Town of Stonington will result in disqualification of town-based business status and loss of any preference given to a town-based business on the part of such bidder as to its bid. The form is available on the Town's website at www.stonington-ct.gov or can be obtained by contacting the Finance Office at 860-535-5070

The Town of Stonington reserves the right to amend or terminate this Invitation to Bid, to reject any or all bidders, to waive and technical or legal deficiencies, to request additional information, to waive any informalities or non- material deficiencies in a response, to determine qualifications exclusively and finally in its sole discretion, to select any firm based on any combination of factors, and the Town's best interests, to negotiate with any firm submitting a bid for different or additional terms, and to take any and all other action that, in the Town's sole judgment, will be in its best interests.

The Town of Stonington is an:

AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER
MBE/WBE AND SBE's are encouraged to bid

END OF NOTICE TO BID

INVITATION TO BID FOR RENOVATION OF
SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

TIMELINE OF THE BID PROCESS-KEY DATES:

ITB Issue Date / Documents Available:
May 4, 2022

Mandatory Pre-bid conference and walkthrough:
Wednesday May 18, 2022 2:00 p.m on the courts

Final Date to Submit Questions:
May 20,2022 3:00p.m.

Final Addednum:
May 23, 2022 5:00p.m.

Bids Due: Date/Time:
May 26, 2022 at 2:00 p.m.

Bid Submission Place: Stonington Town Hall, 152 Elm Street, Stonington, CT 06378.

Proposal Opening Date/Time: May 26, 2022 at 2:00 p.m.

Proposal Opening Place: Finance Department, 152 Elm Street, Stonington, CT 06378.

Proposed Construction: Construction shall start no sooner than September 1, 2022. Construction shall be Substantially Complete No later than May 15, 2023

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I. SCOPE OF SERVICES

OWNER: Town of Stonington, Connecticut

ARCHITECT: Kaestle Boos Associates, Inc., 416 Slater Road, New Britain, CT 06053 Phone 860-229-0361

General Description of the Work: Selective demolition of the existing asphalt surfacing, chain link fencing, athletic lighting and amenities, as required to accommodate installation of a new post-tension concrete base over the existing asphalt. Construction includes six new post tensioned concrete tennis courts and two post tension pickleball courts, new fencing, new athletic lighting, asphalt walks, perimeter grading, and amenities. Alternates include windscreens, athletic lighting and lighting controls. Refer to Alternates section and site plans for detailed breakout of alternates.

II. QUALIFICATION OF CONTRACTORS

Attach a copy of AIA Document A305, Contractor's Qualification Statement, to the BID FORM. Failure to do so may result in rejection of bid.

III. INQUIRIES

All inquiries relative to the conditions and specifications listed herein as well as clarification of any information contained or referenced in this ITB must be submitted in writing (or email) to Eric Roise at Kaestle Boos Associates, Inc., at eroise@kba-architects.com no later than **3:00 PM on Friday May 20, 2022** with copy to James Sullivan, Director of Finance, Town of Stonington, at jsullivan@stonington-ct.gov.

The Town will answer all relevant written questions by issuing one or more addenda, which shall become part of this INVITATION TO BID.

IV. SUBMISSION OF PROPOSALS

General Requirements: Respondents are asked to provide Proposals for the scope of work in accordance with all the terms and specification contained herein.

Respondents shall submit one (1) original and two (2) hard copies and one (1) electronic copy (a compiled Adobe PDF file) of their Bid package.

4. Exhibits:
   - A) Bid Form
   - B) Non-Collusion Affidavit
   - C) Statement of Qualifications
   - D) Required Disclosures
   - E) Affirmative Action Affidavit
   - F) Legal Status Disclosure
   - G) Bid Bond

   H) Prior to Contract Signing:
   - COI with Insurance Limits specified in Exhibit G
   - Performance and Payment Bond
   - Materials and Labor Bond

V. SELECTION PROCESS AND CRITERIA

Proposals will be evaluated on their qualifications and value by the Director of Public Works or her appointees using the following criteria**:**

1. Contractor Qualifications
2. Bid proposal adherence to technical specifications.
3. Ability to deliver goods and services in a timely fashion.
4. Proposed project schedule.
5. Value of proposed fees.
6. Compliance/completion with/of submission requirements noted above in Section IV.

VI. GENERAL TERMS AND CONDITIONS

1. The Town reserves the right to reject any and all proposals, to waive any informality, to request interviews of proposers prior to award and to select and negotiate the proposed services in the best interest of the Town.

2. The Town reserves the right to accept all or part of any proposal, and to negotiate a contract for services and cost with the selected firm or team.

3. The Selected firm shall guarantee to provide the goods at the price of the proposal for a period of not less than sixty (60) days from the deadline for submission of proposals.

4. Unless otherwise stated, Payment Requests are to be submitted no more than once per month. Each Payment Request shall be signed by the Selected firm and shall constitute the Selected firm's representation that quantity of work has reached the level for which payment is requested, and that the Selected firm knows no reason why payment should not be made as requested. The Payment Request shall include an itemization of all services provided, including unit list price, net price, extensions and total amount due. The Town shall approve by signature the amount that, in the opinion of the Town, is properly owing to the Selected firm.

5. Unless otherwise stated, payment will be made within thirty (30) days of the completion of the work, in an acceptable fashion, to the Town and receipt of invoice, whichever is later.

6. *As a municipal project this project is exempt from all sales and Federal excise taxes.*

7. None of the services covered by the contract shall be assigned in full or in part, or sub-contracted without the prior approval of the Town.

8. Unless otherwise specified all costs listed shall be for the full construction for the term of the contract.

9. Proposal shall also mean quotation, bid, offer, qualification/experience statement, and services. Proposers shall also mean vendors, offerors, bidders, or any person or firm responding to the Invitation to Bid.

10. All contracts entered into by the Town shall be governed by the Laws of the State of Connecticut. Any disputes shall be resolved within the venue of the State of Connecticut.

AWARD TO OTHER THAN THE APPARENT LOW BIDDER: The Town of Stonington reserves the right to award the work to a proposer other than the one which submitted the lowest price if it deems such action to be in the best interest of the Town of Stonington.

AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYTERS
MBE/WBE AND SBE'S ARE ENCOURAGED TO BID

TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

VII. STANDARD INSTRUCTIONS TO PROPOSERS

INTRODUCTION

Interested parties should submit a proposal in accordance with the requirements and directions contained in this INVITATION TO BID. ***Proposers are prohibited from contacting any Town employee, officer or official concerning this INVITATION TO BID, except as set forth in Section 3, below. A proposer's failure to comply with this requirement may result in disqualification.***

If there are any conflicts between the provisions of these Standard Instructions to Proposers and any other documents comprising this INVITATION TO BID, these Standard Instructions to Proposers shall prevail.

1. RIGHT TO AMEND OR TERMINATE THE INVITATION TO BID OR CONTRACT

The Town may, before or after proposal opening and in its sole discretion, clarify, modify, amend or terminate this INVITATION TO BID if the Town determines it is in the Town's best interest. Any such action shall be effected by a posting on the Town's website, http://www.stonington-ct.gov/bids-rfps and/or the CT DAS Contracting Portal. **Each proposer is responsible for checking the Town's website and CT DAS Contracting Portal to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the INVITATION TO BID as modified by the addenda.**

Bidders are cautioned not to rely on 3rd party plan rooms for obtaining bid information. The town shall not be responsible for information obtained from 3rd party sources.

2. PROPOSAL SUBMISSION INSTRUCTIONS

Proposals must be received, by the date and time noted in the INVITATION TO BID prior to the date and time the proposals are scheduled to be opened publicly. Postmarks prior to the opening date and time do **NOT** satisfy this condition. The Town will not accept submissions by fax. Proposers are solely responsible for ensuring timely delivery. The Town will **NOT** accept late proposals.

One (1) original and two (2) hard copies, along with a digital copy of all proposal documents must be submitted in sealed, opaque envelopes clearly labeled with the proposer's name, the proposer's address, the words **"BID#2021-008 ENCLOSED – Spellman Park Tennis Court Renovations".** The Town may decline to accept proposals submitted in unmarked envelopes that the Town opens in its normal course of business. The Town may, but shall not be required to, return such proposal documents and inform the proposer that the proposal documents may be resubmitted in a sealed envelope properly marked as described above.

Proposal fee must be submitted on the Bid Form included in this INVITATION TO BID, see **Exhibit F**. All blank spaces for proposal prices must be completed in ink or be typewritten; proposal fee must be stated in both words and figures. The person signing the Proposal Form must initial any errors, alterations or corrections on that form. Ditto marks or words such as "SAME" shall not be used in the Proposal Form.

Proposals may be withdrawn personally or in writing provided that the Town receives the withdrawal prior to the date and time the proposals are scheduled to be opened. Proposals are considered valid, and may not be withdrawn, cancelled or modified, for sixty (60) calendar days after the opening date, to give the Town sufficient time to review the proposals, investigate the proposers' qualifications, secure any required municipal approvals, and execute a binding contract with the successful proposer.

An authorized person representing the legal entity of the proposer must sign the Proposal Form and all other forms included in this INVITATION TO BID.

3. QUESTIONS AND AMENDMENTS

Questions concerning the process and procedures applicable to this INVITATION TO BID are to be submitted **only in writing via email** and directed **to**:

Eric Roise
Kaestle Boos Associates, Inc.

Email: eroise@kba-architects.com

Proposers shall copy Mr. James. Sullivan, jsullivan@stonington-ct.gov as well.

Proposers are prohibited from contacting any Town employee, officer or official concerning this INVITATION TO BID other than the designated official noted above. A proposer's failure to comply with this requirement may result in disqualification.

Questions from proposers must be received no later than the date specified under the time line.

Questions will be addressed via issue of one or more addenda, which shall be a part of this INVITATION TO BID and the resulting Contract.

The Town will post any addenda on Town's website, http://www.stonington-ct.gov/bids-rfps or on the CT DAS contracting portal. **Each proposer is responsible for checking the websites to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the INVITATION TO BID as modified by the addenda.**

No oral statement of the Town, or the Town representatives listed above, shall be effective to waive, change or otherwise modify any of the provisions of this INVITATION TO BID, and no proposer shall rely on any alleged oral statement.

4. ADDITIONAL INFORMATION

The Town reserves the right, either before or after the opening of proposals, to ask any proposer to clarify its proposal or to submit additional information that the Town in its sole discretion deems desirable.

5. COSTS FOR PREPARING PROPOSAL

Each proposer's costs incurred in developing its proposal are its sole responsibility, and the Town shall have no liability for such costs.

6. OWNERSHIP OF PROPOSALS

All proposals submitted become the Town's property and will not be returned to proposers.

7. FREEDOM OF INFORMATION ACT

All information submitted in a proposal or in response to a request for additional information is subject to disclosure under the Connecticut Freedom of Information Act as amended and judicially interpreted. Proposers are encouraged not to include personal information unless specifically asked to do so. A proposer's responses may contain financial, trade secret or other data that it claims should not be public (the "Confidential Information"). A proposer must identify specifically the pages and portions of its proposal or additional information that contain the claimed Confidential Information by visibly marking all such pages and portions. Provided that the proposer cooperates with the Town as described in this section, the Town shall, to the extent permitted by law, protect from unauthorized disclosure such Confidential Information.

If the Town receives a request for a proposer's Confidential Information, it will promptly notify the proposer in writing of such request and provide the proposer with a copy of any written disclosure request. The proposer may provide written consent to the disclosure or may object to the disclosure by notifying the Town in writing to withhold disclosure of the information, identifying in the notice the basis for its objection, including the statutory exemption(s) from disclosure. The proposer shall be responsible for defending any complaint brought in connection with the nondisclosure, including but not only appearing before the Freedom of Information Commission, and providing witnesses and documents as appropriate.

8. REQUIRED DISCLOSURES

Each proposer must, in its Required Disclosures Form, (see **Exhibit D)** make the disclosures set forth in that form. A proposer's acceptability based on those disclosures lies solely in the Town's discretion.

9. REFERENCES

Each proposer must complete and submit the Proposer's qualification statement included in this INVITATION TO BID, see **Exhibit C**.

10. LEGAL STATUS

If a proposer is a corporation, limited liability company, or other business entity that is required to register with the Connecticut Secretary of the State's Office, it must have a current registration on file with that office. The Town may, in its sole discretion, request acceptable evidence of any proposer's legal status. Each proposer must complete the Proposer's Legal Status Disclosure Form included in this INVITATION TO BID, see **Exhibit A**.

11. PERFORMANCE SECURITY

The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond in amounts equal to at least one hundred percent (100%) of the contract price as security for the faithful performance of the Contract, and for the payment of all persons performing labor on the project under this contract and furnishing materials, equipment and all other incidentals in connection with this contract. The Surety on such a bond shall be satisfactory to the Owner and the cost of the same shall be borne by the Contractor. Prior to the starting of any work, the bonds must be approved by the Owner and be in the Owner's hands. The bonds must be from a surety company licensed and approved to do business in the State of Connecticut and shall remain in effect through the guarantee period

12. PROPOSAL (BID BOND) SECURITY

Each bid must be accompanied by a bid bond duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five (5) percent of the bid. Such bid bonds will be returned to all but the three lowest bidders within five days after the opening of bids, and the remaining bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract; or if no award has been made within 60 days after the date of the opening of the bids, upon demand of the bidder at any time there- after, so long as he has not been notified of the acceptance of his bid. The bid bond of the successful bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned.

13. PRESUMPTION OF PROPOSER'S FULL KNOWLEDGE

Each proposer is responsible for having read and understood each document in this INVITATION TO BID and any addenda issued by the Town. A proposer's failure to have reviewed all information that is part of or applicable to this INVITATION TO BID, including but not only any addenda posted on the Town's website and/or CT DAS Contracting Portal, shall in no way relieve it from any aspect of its proposal or the obligations related thereto.

Each proposer is deemed to be familiar with and is required to comply with all federal, state and local laws, regulations, ordinances, codes and orders that in any manner relate to this INVITATION TO BID or the provision or goods or performance of the work described herein.

By submitting a proposal, each proposer represents that it has thoroughly examined and become familiar with the scope of work outlined/the goods described in this INVITATION TO BID, and it is capable of performing the work/delivering/installing the goods to achieve the Town's objectives. If applicable, each proposer shall visit the site, examine the areas and thoroughly familiarize itself with all conditions of the property before preparing its proposal.

14. TAX EXEMPTIONS

The Town is exempt from the payment of federal excise taxes and Connecticut sales and use taxes. Exemption from State sales tax per Conn. Gen. Stat. Chapter 219, § 12-412(1).
Federal Tax-Exempt number will be provided to the selected firm prior to execution of contract.

15. INSURANCE

The successful proposer shall, at its own expense and cost, obtain and keep in force at least the insurance listed in the Insurance Requirements that are a part of this ITB, as delineated in **Exhibit G**. The Town reserves the right to request from the successful proposer a complete, certified copy of each required insurance policy. A sample Certificate of Insurance should be submitted with bid proposal.

16. AWARD CRITERIA; PRELIMINARY SELECTION; CONTRACT EXECUTION

All proposals will be publicly opened and read aloud as received on the date, at the time, and at the place identified in this INVITATION TO BID. Proposers may be present at the opening.

The Town reserves the right to correct, after proposer verification, any mistake in a proposal that is a clerical error, such as a price extension, decimal point error or FOB terms. If an error exists in an extension of prices, the unit price shall prevail. In the event of a discrepancy between the price quoted in words and in figures, the words shall control.

The Town reserves the rights to accept all or any part of a proposal, reject all proposals, and waive any informalities or non-material deficiencies in a proposal. The Town also reserves the right, if applicable, to award the purchase of individual items under this INVITATION TO BID to any combination of separate proposals or proposers.

The Town will select the lowest responsible & qualified proposer, meaning that, in addition to price, due consideration will be given to factors such as a proposer's experience, references, capabilities, past performance, and other relevant criteria.

The Town will not award the proposal to any business that or person who is in arrears or in default to the Town with regard to any tax, debt, contract, security or any other obligation.

The Town will issue a Preliminary Notice of Intent to Award. The preliminary notice of award may be subject to further negotiations with the proposer. **The making of a preliminary award to a proposer does not provide the proposer with any rights and does not impose upon the Town any obligations. The Town is free to withdraw a preliminary award at any time and for any reason. A proposer has rights, and the Town has obligations, <u>only if and when</u> a Contract is executed by the Town and the proposer.**

17. NONRESIDENT CONTRACTORS

If the successful proposer is a "nonresident contractor" as defined in Conn. Gen. Stat. § 12- 430(7)(A) as amended, it shall comply fully with the provisions of § 12-430(7) and, prior to execution of the Contract, shall furnish the Town with proof that it is a "verified contractor" within the meaning of

General Statutes Section 12-430(7) or that it has posted a bond with the Commissioner of Revenue Services in compliance with General Statutes Section 12-430(7). The successful proposer agrees to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from any and all taxes, interest and penalties that the State of Connecticut asserts are due with respect to the successful proposer's activities under the Contract.

Connecticut General Statute §12-430(7) requires that:

When a non-resident contractor enters into a contract, they must post a 5% cash or guarantee bond for the total amount with the Commissioner of Revenue Services;
or
Any person dealing with a non-resident contractor without first obtaining a certificate of compliance must deduct 5% from the amount payable to the non-resident contractor and submit it to the state.

If the requirements are not met, the general contractor will be liable for all Connecticut taxes imposed.

All questions shall be directed to the State of Connecticut Department of Revenue Services Discovery Unit at 860-541-3280.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this section, whether or not a lawsuit or other proceeding is commenced, which obligations shall survive the termination or expiration of the Contract.

18. COMPLIANCE WITH LAWS

The successful proposer shall comply with all applicable laws, regulations, ordinances, codes and orders of the United States, the State of Connecticut and the Town related to its proposal and the performance of the Contract.

Immigration Laws

By submitting a proposal, each proposer confirms that it has complied, and during the term of the Contract will comply, with the Immigration Reform and Control Act ("IRCA") and that each person it provides under the Contract will at all times be authorized for employment in the United States of America. Each proposer confirms that it has a properly completed Employment Eligibility Verification, Form I-9, for each person who will be assigned under the Contract and that it will require each subcontractor, if any, to confirm that it has a properly completed Form I-9 for each person who will be assigned under the Contract.

The successful proposer shall defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), against any and all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including fines, penalties, punitive damages, attorney's fees and costs, brought or assessed against, or incurred by, the Town Indemnified Parties related to or arising from the obligations under IRCA imposed upon

the successful proposer or its subcontractor. The successful proposer shall also be required to pay any and all attorney's fees and costs incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this provision, whether or not a lawsuit or other proceeding is commenced. The successful proposer's obligations under this section shall survive the termination or expiration of the Contract.

Non-Discrimination and Affirmative Action

In the performance of the Contract, the successful proposer will not discriminate or permit discrimination in any manner prohibited by the laws of the United States or of the State of Connecticut against any person or group of persons on the grounds of race, color, religious creed, age (except minimum age), marital status or civil union status, national origin, ancestry, sex, sexual orientation, mental retardation, mental disability or physical disability, including but not limited to blindness, unless the successful proposer shows that such disability prevents performance of the work involved.

In the performance of the Contract, the successful proposer will 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 (except minimum age), marital status or civil union status, national origin, ancestry, sex, sexual orientation, mental retardation, mental disability or physical disability, including but not limited to blindness, unless the successful proposer shows that such disability prevents performance of the work involved.

Any violation of these provisions shall be considered a material violation of the Contract and shall be grounds for the Town's cancellation, termination or suspension, in whole or in part, of the Contract and may result in ineligibility for further Town contracts.

Connecticut's Prevailing Wage Law Provision

Prevailing wage requirements will apply to this project. If applicable, the contractor must be in full compliance with CGS Section 31-53 and 31-53(a) which applies to each contract for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration, or repair of any public works project by the state or its agents, or by any political subdivision of the State, CGS Section 31-53 (g) provides monetary thresholds which must be met before the law is applicable. In accordance with CGS Section 31-53, projects are subject to the payment of minimum prevailing wages where the total cost of all work to be performed by all contractors and subcontractors in connection with new construction of any public works project is $1,000,000 or more and where the total cost of all work to be performed by all contractors and subcontractors in connection with any remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project is $100,000 or more. For qualifying projects, all contractors and subcontractors shall submit to the Finance Department certified weekly payrolls for all contracts meeting the stated monetary limits. The certified payrolls shall be submitted to the Finance Department with the contractor's monthly certificate for payment. The contractor should familiarize themselves with all aspects of the provisions under state law in order to ensure full compliance.

Executive Orders

The contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgate June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgate February 15, 1973, concerning the listing of employment opening and Executive Order No. Sixteen of Governor John G. Rowland promulgated

August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgate April 1 7, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

Occupational Safety and Health Administration Requirement

According to CGS, Section 31-53b (a) each contract entered into on or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by a political subdivision of the state or any of its agents, where the total cost of all work to be performed by all contractors and subcontractors in connection with the contract is at least $100,000 shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building , pursuant to such contract, have 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, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268. The aforesaid provisions shall be deemed to be incorporated into the Contract with the Town. The contractors should familiarize themselves with all aspects of state law and any applicable regulations pertaining to these requirements in order to ensure full compliance.

19. NON COLLUSION AFFIDAVIT

Each proposer shall submit a completed Proposer's Non-Collusion Affidavit Form that is part of this INVITATION TO BID, see **Exhibit B**.

20. CONTRACT TERMS

The following provisions will be mandatory terms of the Town's Contract with the successful proposer. If a proposer is unwilling or unable to meet, or seeks to clarify or modify, any of these Contract Terms, the proposer must disclose that inability, unwillingness, clarification and/or modification in its Proposal Form.

a. DEFENSE, HOLD HARMLESS AND INDEMNIFICATION

The successful proposer agrees, to the fullest extent permitted by law, to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from and against all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including attorney's fees, arising out of or relating, directly or indirectly, to the successful proposer's malfeasance, misconduct, negligence or failure to meet its obligations under the INVITATION TO BID or the Contract. The successful proposer's obligations under this section shall not be limited in any way by any limitation on the amount or type of the successful proposer's insurance.

Nothing in this section shall obligate the successful proposer to indemnify the Town or its Indemnified Parties against liability for damage arising out of bodily injury to persons or

damage to property caused by or resulting from the negligence of the Town Indemnified Parties**.**

In any and all claims against the Town or its Indemnified Parties made or brought by any employee of the successful proposer, or anyone directly or indirectly employed or contracted with by the successful proposer, or anyone for whose acts or omissions the successful proposer is or may be liable, the successful proposer's obligations under this section shall not be limited by any limitation on the amount or type of damages, compensation or benefits payable by the successful proposer under workers' compensation acts, disability benefit acts, or other employee benefits acts.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town or its Indemnified Parties in enforcing any of the successful proposer's obligations under this section. The successful proposer's obligations under this section shall survive the termination or expiration of the Contract.

As a municipal agency of the State of Connecticut, the Town will NOT defend, indemnify, or hold harmless the successful proposer.

b. <u>ADVERTISING</u>

The successful proposer shall not name the Town in its advertising, news releases, or promotional efforts without the Town's prior written approval.

If it chooses, the successful proposer may list the Town in a Statement of References or similar document required as part of its response to a public procurement. The Town's permission to the successful proposer to do so is not a statement about the quality of the successful proposer's work or the Town's endorsement of the successful proposer.

c. <u>SUBCONTRACTING</u>

Prior to entering into any subcontract agreement(s) for the work described in the Contract, the successful proposer shall provide the Town with written notice of the identity (full legal name, street address, mailing address (if different from street address), and telephone number) of each proposed subcontractor. The Town shall have the right to object to any proposed subcontractor by providing the successful proposer with written notice thereof within seven (7) business days of receipt of all required information about the proposed subcontractor. If the Town objects to a proposed subcontractor, the successful proposer shall not use that subcontractor for any portion of the work described in the Contract.

All permitted subcontracting shall be subject to the same terms and conditions as are applicable to the successful proposer. The successful proposer shall remain fully and solely liable and responsible to the Town for performance of the work described in the Contract. The successful proposer also agrees to promptly pay each of its subcontractors within thirty (30) days of receipt of payment from the Town or otherwise in accordance with law. The successful proposer shall assure compliance with all requirements of the Contract. The successful proposer shall also be fully and solely responsible to the Town for the acts and omissions of its subcontractors and of persons employed, whether directly or indirectly, by its

subcontractor(s).

d. PREFERENCES

The successful proposer shall comply with the requirements of Conn. Gen. Stat. § 31-52(b), as amended. Specifically, the successful proposer agrees that in the employment of labor to perform the work under the Contract, preference shall be given to citizens of the United States who are, and have been continuously for at least three (3) months prior to the date of the Contract, residents of the labor market area (as established by the State of Connecticut Labor Commissioner) in which such work is to be done, and if no such qualified person is available, then to citizens who have continuously resided in Hartford County for at least three (3) months prior to the date hereof, and then to citizens of the State who have continuously resided in the State at least three (3) months prior to the date of the Contract.

e. LICENSES AND PERMITS

The successful proposer certifies that, throughout the Contract term, it shall have and provide proof of all approvals, permits and licenses required by the Town and/or any state or federal authority. The successful proposer shall immediately and in writing notify the Town of the loss or suspension of any such approval, permit or license.

f. CESSATION OF BUSINESS/BANKRUPTCY/RECEIVERSHIP

If the successful proposer ceases to exist, dissolves as a business entity, ceases to operate, files a petition or proceeding under any bankruptcy or insolvency laws or has such a petition or proceeding filed against it, the Town has the right to terminate the Contract effective immediately. In that event, the Town reserves the right, in its sole discretion as it deems appropriate and without prior notice to the successful proposer, to make arrangements with another person or business entity to provide the services described in the Contract and to exercise any or all of its rights at Law, in equity, and/or under the Contract.

g. AMENDMENTS

The Contract may not be altered or amended except by the written agreement of both parties.

h. ENTIRE AGREEMENT

It is expressly understood and agreed that the Contract contains the entire agreement between the parties, and that the parties are not, and shall not be, bound by any stipulations, representations, agreements or promises, oral or otherwise, not printed or inserted in the Contract or its attached exhibits.

i. VALIDITY

The invalidity of one or more of the phrases, sentences or clauses contained in the Contract shall not affect the remaining portions so long as the material purposes of the Contract can be determined and effectuated.

j. CONNECTICUT LAW AND COURTS

The Contract shall be governed by and construed in accordance with the internal laws (as opposed to the conflicts of law provisions) of the State of Connecticut, and the parties irrevocably submit in any suit, action or proceeding arising out of the Contract to the jurisdiction of the United States District Court for the District of Connecticut or of any court of the State of Connecticut, as applicable.

k. NON-EMPLOYMENT RELATIONSHIP

The Town and the successful proposer are independent parties. Nothing contained in the Contract shall create, or be construed or deemed as creating, the relationships of principal and agent, partnership, joint venture, employer and employee, and/or any relationship other than that of independent parties contracting with each other solely for the purpose of carrying out the terms and conditions of the Contract. The successful proposer understands and agrees that it is not entitled to employee benefits, including but not limited to worker's compensation and employment insurance coverage, and disability. The successful proposer shall be solely responsible for any applicable taxes.

21. LOCAL VENDOR PREFERENCE

The Town has a local vendor preference ordinance. Any bidder that qualifies for the "LOCAL VENDOR PREFERENCE" must fill out a "Town-Based Business Affidavit Form" signed by an authorized representative of the bidder at the time of the bid submittal in order to be considered for this preference. Failure to submit a Town Based Business Affidavit on the form provided by the Town of Stonington will result in disqualification of town-based business status and loss of any preference given to a town-based business on the part of such bidder as to its bid. The form is available on the Town's website at www.stonington-ct.gov or can be obtained by contacting the Finance Department at 860-535-5070.

22. QUALIFICATIONS OF BIDDER

The Town may make whatever investigations it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Town all information and data for this purpose as the Town may request. The Town reserves the right to reject any bid if the evidence submitted by, or investigation of, the bidder fails to satisfy the Town that the bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

END OF STANDARD INSTRUCTIONS TO PROPOSERS

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EXHIBIT A

TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

PROPOSER'S LEGAL STATUS DISCLOSURE

Please fully complete the applicable section below, attaching a separate sheet if you need additional space.

For purposes of this disclosure, "permanent place of business" means an office continuously maintained, occupied and used by the proposer's regular employees regularly in attendance to carry on the proposer's business in the proposer's own name. An office maintained, occupied and used by a proposer only for the duration of a contract will not be considered a permanent place of business. An office maintained, occupied and used by a person affiliated with a proposer will not be considered a permanent place of business of the proposer.

IF A SOLELY OWNED BUSINESS:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address)_____

Owner's Full Legal Name _____

Number of years engaged in business under sole proprietor or trade name _____

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A CORPORATION:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address)_____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Officers

_____	_____	_____
President	Secretary	Chief Financial Officer

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A LIMITED LIABILITY COMPANY:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address)_____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Manager(s) and Member(s)

_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A PARTNERSHIP:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address)_____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Partners

_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

_____
Proposer's Full Legal Name

_____
(print)
Name and Title of Proposer's Authorized Representative

_____
(signature)
Proposer's Representative, Duly Authorized

_____
Date

END OF LEGAL STATUS DISCLOSURE FORM

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EXHIBIT B

TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

PROPOSER'S NON-COLLUSION AFFIDAVIT FORM

PROPOSAL FOR:

The undersigned proposer, having fully informed himself/herself/itself regarding the accuracy of the statements made herein, certifies that:

(1) the proposal is genuine; it is not a collusive or sham proposal;

(2) the proposer developed the proposal independently and submitted it without collusion with, and without any agreement, understanding, communication or planned common course of action with, any other person or entity designed to limit independent competition;

(3) the proposer, its employees and agents have not communicated the contents of the proposal to any person not an employee or agent of the proposer and will not communicate the proposal to any such person prior to the official opening of the proposal; and

(4) no elected or appointed official or other officer or employee of the Town of Stonington is directly or indirectly interested in the proposer's proposal, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.

The undersigned proposer further certifies that this affidavit is executed for the purpose of inducing the Town of Stonington to consider its proposal and make an award in accordance therewith.

_____

Legal Name of Proposer

(signature)
Proposer's Representative, Duly Authorized

_____

Name of Proposer's Authorized Representative

_____

Title of Proposer's Authorized Representative

_____

Date

Subscribed and sworn to before me this_____day of_____, 20___.

_____

Notary Public
My Commission Expires:

END OF NON-COLLUSION AFFIDAVIT FORM

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EXHIBIT C

STATEMENT OF BIDDER'S QUALIFICATIONS
(To be submitted by the Bidder on separate sheets WITH THE BID)

To be considered for this project the bidder must be able to certify that he/she meets or exceeds the required qualifications as follows:
Bidders must have prior specific experience with post-tension concrete tennis courts and tennis court surfacing consisting of the successful construction of no less than five (5) post tension court projects consisting of 3 full size courts or greater in the past 5 years. Post Tension concrete tennis court construction shall have consisted of post tension slabs, tennis surfacing, fencing, nets and posts. Similar post tension court construction type (e.g. basketball, handball) of the same minimum size will also be considered. Project Superintendent proposed for this project shall be the same as all reference projects. Material supplier/installer experience is not acceptable for General Contractor qualifications.
Bidders must provide verification of experience with the bid documents and include the information requested in this Qualification Statement to be considered a responsive bidder.

All questions must be answered, and the data given must be clear and comprehensive. This statement must be notarized. The Bidder may submit any additional information he desires.

1. Name of Bidder and IRS Employers Identification Number.
2. Permanent main office address.
3. When organized.
4. If a corporation, where incorporated.
5. How many years have you been engaged in the contracting business under your present firm or trade name?
6. Have you ever failed to complete any work awarded to you? If so, where and why?
7. List any pending or current litigation that involves your company.
8. List any past litigation involving your company within the past ten (10) years.
9. Provide five (5) post tension concrete court (3 or more courts each project) construction projects in the past five (5) years with project details, including surfacing system/manufacturer and current contact information for each Owner and project designer.
10. Background and experience of the principal members of your organization, including the officers and Project Superintendent.
11. Will you**, upon request**, fill out a detailed financial statement and furnish any other information that may be required by the Owner?
    (actual information/documentation not required at time of bid)
12. Include the following certification on qualification statements: The undersigned hereby authorizes and requests any person, 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 _____, 201__.

_____
(Name of Bidder)

By _____

Title _____

Enclose answers on separate pages with your Bid.
No specific format for this information is required.

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EXHIBIT D

TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

REQUIRED DISCLOSURES

1. Exceptions to/Clarifications of/Modifications of the INVITATION TO BID

_____This proposal does not take exception to or seek to clarify or modify any requirement of the INVITATION TO BID, including but not only any of the Contract Terms set forth in the Standard Instructions to Proposers. **The proposer agrees to each and every requirement, term, provision and condition of this INVITATION TO BID**.

2. State Debarment List

Is the proposer on the State of Connecticut's Debarment List?

_____Yes
_____No
_____Department of Consumer Protection License No.
_____ CT Secretary of State Business ID No.

3. Occupational Safety and Health Law Violations

Has the proposer or any firm, corporation, partnership or association in which it has an interest (1) been cited for three (3) or more willful or serious violations of any occupational safety and health act or of any standard, order or regulation promulgated pursuant to such act, during the three-year period preceding the proposal (provided such violations were cited in accordance with the provisions of any state occupational safety and health act or the Occupational Safety and Health Act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency or court having jurisdiction) or (2) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the proposal?

_____Yes
_____No

If "yes," attach a sheet fully describing each such matter.

4. Arbitration/Litigation

Has either the proposer or any of its principals (current or former, regardless of place of employment) been involved for the most recent ten (10) years in any pending or resolved arbitration or litigation?

_____Yes
_____No

If "yes," attach a sheet fully describing each such matter.

5. Criminal Proceedings

Has the proposer or any of its principals (current or former, regardless of place of employment) ever been the subject of any criminal proceedings?

_____Yes
_____No

If "yes," attach a sheet fully describing each such matter.

6. Ethics and Offenses in Public Projects or Contracts

Has either the proposer or any of its principals (current or former, regardless of place of employment) ever been found to have violated any state or local ethics law, regulation, ordinance, code, policy or standard, or to have committed any other offense arising out of the submission of proposals or bids or the performance of work on public works projects or contracts?

_____Yes
_____No

If "yes," attach a sheet fully describing each such matter.

7. Federal Debarment List

Is the proposer on the Federal Government's Debarment List?

_____Yes
_____No
_____ Federal Duns #

8. MBE and WBE

Has the proposer complied with required MBE and WBE requirements?

_____Yes _____No

END OF REQUIRED DISCLOSURES FORM

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EXHIBIT E

TOWN OF STONINGTON, CONNECTICUT

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

AFFIRMATIVE ACTION/EEO AFFIDAVIT

Concerning Equal Employment Opportunities and/or Affirmative Action Policy I/we, the respondent, certify to the TOWN OF STONINGTON that:

1. I/we are in compliance with the equal opportunity clause as set forth in Connecticut state law (Executive Order No. Three, http://www.cslib.org/exeorder3.htm).
2. I/we do not maintain segregated facilities.
3. I/we have filed all required employer's information reports.
4. I/we have developed and maintain written affirmative action programs.
5. I/we list job openings with federal and state employment services.
6. I/we attempt to employ and advance in employment qualified handicapped individuals.
7. I/we are in compliance with the Americans with Disabilities Act.
8. I/we (check one)
   _____ have an Affirmative Action Program, or
   _____ employ 10 people or fewer

Legal Name of Bidder: _____

Business Name: _____

Business Address: _____

Signature and Title of Person: _____

Subscribed and sworn to me _____

This _____ day of _____, 20____

_____ My Commission Expires_____

Notary Public Date

END OF AFFIDAVIT FORM

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EXHIBIT F

BID FORM

INVITATION TO BID FOR RENOVATION OF SPELLMAN PARK TENNIS COURTS

ITB: #2021-008

Date _____

To: Town of Stonington
Director of Finance
152 Elm Street
Stonington, CT 06378

Pursuant to and in compliance with your "Invitation to Bid" relating thereto, the undersigned,

_____
(Name of Firm)

_____
Contact, Phone and Email

having visited the site and carefully examined the Drawings, Contract Documents and complete Project Manual and Specifications dated May 4, 2022, together with all Addenda issued and received prior to the scheduled closing time for receipt of Bids as prepared by the Architect; Kaestle Boos Associates, Inc., hereby offers and agrees as follows:

To provide all labor, materials, equipment, appliances and whatsoever else necessary to construct and properly finish all work in connection with the,

RENOVATION OF
SPELLMAN PARK TENNIS COURTS
at Spellman Drive, Pawcatuck, CT,

to the satisfaction of the Architect and the Owner for the Base Bid Lump Sum of:

_____($_____)
Written in words

Tennis surfacing manufacturer/Installer carried in Bid:_____

Base bid shall sum shall include all addendum, and allowances as noted in the bid documents and division 1 specification section 'SUMMARY'.

If awarded this Contract, we will execute an Agreement with the Town of Stonington, Owner of the property.

CONTRACT TIME

If awarded the Contract, the undersigned agrees that the work will commence forthwith and shall be substantially complete on or before the dates listed in Division 1 Section 'Summary'.

QUALIFICATIONS:

By submitting this proposal, the bidder certifies that he/she meets or exceeds the required qualifications. Bidders must have prior specific experience with post-tension concrete tennis courts and tennis court surfacing consisting of the successful construction of no less than five (5) post tension court projects consisting of 3 full size courts or greater in the past 5 years. Post Tension concrete tennis court construction shall have consisted of post tension slabs, tennis surfacing, fencing, nets and posts. Similar post tension court construction type (e.g. basketball, handball) of the same minimum size will also be considered. Project Superintendent proposed for this project shall be the same as all reference projects. Material supplier/installer experience is not acceptable for General Contractor qualifications. Bidders must provide verification of experience with this Form of Proposal and include a completed Bidders Qualification Statement with this proposal for the proposal to be considered.

UNIT PRICES

Should the amount of improvements required be increased or decreased due to special considerations found at the site or because of a request of the **Town of Stonington,** the undersigned agrees that the following supplemental UNIT PRICES will be the basic price in place for computing the EXTRA or CREDIT.

Each UNIT PRICE shall include all equipment, tools, labor, permits, fees, etc., incidental to the installation and completion of the work involved.

The amounts shown are net changes to the Contract for additional work and include the Contractor's and any Subcontractor's amounts for overhead and profit. For deleted work, the net credit to the Contract shall be 10% less.

All work is to be accomplished in accordance with applicable Sections of the Specifications.

C.Y. = cubic yard	S.F. = square foot
S.Y. = square yard	V.F. = vertical foot
L.F. = linear foot	EA = Each

ITEMS

1.	Mass Earth Work	$ _____
2.	Granular Base Fill	$ _____
3.	Processed Aggregate	$ _____
4.	Post tension concrete tennis base & surfacing (10 SY)	$ _____
5.	10' High Black Vinyl Coated Chain-Link Fencing	$ _____
6.	Topsoil and lawn establishment (10SY)	$ _____

ALTERNATES

The undersigned Bidder further proposed and agrees that should the following Alternates be accepted and included in the Contract, the amount of the Lump Sum Bid, as heretofore stated, shall be adjusted by the amount of said Alternates. All materials and workmanship shall be in strict accordance with the Drawings and specification and shall be in place prices. Refer to specification section 01 23 00 Alternates and the drawings for a detailed information and narratives for the scope of each Alternate.

Alternate No. 1: ADD: Provide 4 athletic light poles including all lights, footings, controls and wiring necessary for a working athletic lighting system for the south portion of the proposed courts (south bank of courts) See detailed requirements under Division 1 section ALTERNATES. (note: conduit and trenching is BASE BID):

Add $_____

Alternate No. 2: ADD: Provide 2 additional athletic light poles including all lights, footings, controls and wiring necessary for a working athletic lighting system for the north portion of the proposed courts (north bank of courts) See detailed requirements under Division 1 section ALTERNATES. (note: conduit and trenching is BASE BID):

Add $_____

Alternate No. 3: ADD: Windscreens with Graphic Logo: Provide and install windscreens with graphic logo on north and east sides of tennis court fencing. See detailed requirements under Division 1 section ALTERNATES.

Add $_____

ADDENDUM

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on this project. The Bid includes Addenda listed below and they are hereby acknowledged:

Addendum # _____ Dated _____

Addendum # _____ Dated _____

Enclosed herewith, is the Bid (bond) Security duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five (5) percent of the bid:

Bid bond in the amount of: $_____

COMPANY NAME:_____

ADDRESS:_____ _____

_____

BY: _____

(authorized signature, officer of bidder's company)

_____

(above name typewritten)

TITLE: _____

TELEPHONE #: _____ EMAIL: _____

END OF BID FORM

EXHIBIT G

TOWN OF STONINGTON, CONNECTICUT

INSURANCE REQUIREMENTS

Contractor shall purchase and maintain without interruption from the date of commencement of the Services until the date of final payment for the last Project to be completed and for the additional periods specified herein, the following insurance and all insurance that may be required under any Applicable Laws, written by insurance companies with a rating of at least an "A-VIII" in the latest addition of A.M. Best. If Contractor fails to obtain and keep in force the insurance required hereunder, Owner may obtain and maintain the required insurance in the name of Contractor and the cost thereof shall be payable by Contractor to Owner on demand. Failure to maintain the insurance coverage required or failure to comply fully with any of the insurance provisions as may be necessary to carry out the terms and provisions of the Agreement shall be deemed to be a material breach of the Agreement. Insurance requirements are independent of, and in addition to, Contractor's liability under the Agreement. The limits and coverages set forth in this Exhibit are the minimum requirements under the Agreement. Except for Professional Liability and Workers Compensation insurance which cannot have additional insureds, the inclusion of these minimum requirements shall not be interpreted to restrict the rights of the Additional Insureds to the stated minimum coverage amounts in the event the Contractor maintains coverage at higher limits. Nothing in the Agreement shall be deemed to limit Contractor's liability under the Agreement to the limits of the insurance coverages required hereunder. Contractor shall be solely responsible for payment of all deductible or retention amounts pertaining to any insurance required hereby. 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 the 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. Capitalized terms in this Exhibit that are not specifically defined in this Exhibit shall have the meanings set forth in the Agreement to which this Exhibit is attached.

1. **Commercial General Liability** ("CGL") insurance on an "occurrence" basis for bodily injury and property damage that may arise out of or result from Contractor's operations and completed operations under the Agreement, whether such operations be by Contractor or by anyone directly or indirectly employed by the Contractor, or by anyone for whose acts the Contractor may be liable. Such insurance shall include, along with other coverages available to the Contractor or under the CGL policy, each of the following:

   (a) At a minimum, the following limits and coverages:

      (i) $1,000,000 each occurrence or the full per occurrence limits of the policy, whichever is greater

      (ii) $1,000,000 personal and advertising injury or the full personal and advertising injury limits of the policy, whichever is greater

(iii) $5,000,000 general aggregate or the full general aggregate limits of the policy, whichever is greater
(iv) $300,000 damage to rented premises
(v) $10,000 Medical Expenses

(b) Coverage for ongoing operations, independent Contractors, and any persons or entities performing work on behalf of Contractor.

(c) Products and completed operations coverage, which coverage shall be maintained in effect for a period equivalent to the statute of repose for the state in which the Project is located.

(d) An appropriate endorsement acceptable to Owner stating that "limits apply per project."

(e) Contractual liability coverage.

(f) Contain a severability or separation of insureds clause.

(g) The insurance maintained by Contractor shall be primary and noncontributory, and any other insurance or self-insurance maintained by Owner or the Additional Insureds is in excess and shall not contribute to Contractor's insurance in all instances regardless of any like insurance that Owner or the Additional Insureds may have.

(h) No exclusion or limitation for residential construction.

(i) Waiver of Subrogation endorsement in favor of Owner.

2. **Commercial Automobile Liability** coverage to include owned, hired and non-owned automobile liability insurance covering all use of all automobiles, trucks and other motor vehicles utilized by Contractor, including each of the following:

(a) A combined single limit for bodily injury and property damage of $1,000,000 per accident.

(b) Coverage for upset, overturn and collision coverage related to pollution events (applying to the vehicle, trailer or other attachments to vehicle and extend to cargo/waste carried and to Contractors or others providing services to Contractor).

(c) Waiver of Subrogation endorsement in favor of Owner.

3. Follow-form **umbrella (excess) liability** insurance with a limit of $5,000,000 each occurrence in excess of the general liability, employer's liability, workers' compensation liability, and business automobile liability coverages required of Contractor under this Exhibit. Such insurance shall contain a provision that it will not be more restrictive than the primary insurance. Aggregate limits of liability shall apply separately with respect to the Project.

4. **Workers' Compensation insurance**, including employer's liability, for all persons whom Contractor employs (or uses as contract labor if the Contractor is uninsured) in carrying out any Work. Such insurance shall be in strict compliance

with the requirements of the most current and applicable workers' compensation insurance laws in effect from time to time in the state(s) where the Services are performed, and shall include the following:

(a) Coverage A (Workers' Compensation) - Statutory

(b) Coverage B (Employer's Liability)
At a minimum, the following limits and coverages:
(i) $500,000 for each accident, for bodily injury by accident
(ii) $500,000 for each employee, for bodily injury by disease
(iii) $500,000 for each disease policy limit

(c) Waiver of Subrogation endorsement in favor of Owner.

(d) Contain endorsements that provide:

(i) Voluntary Compensation

5. **Property insurance** providing coverage for property in which Contractor retains the risk of loss including their own equipment, (stationary or mobile), tools (including employee tools), supplies, materials, or any other property owned or leased by Contractor. If Contractor chooses to self-insure any of the property described under this Paragraph, it is agreed that Contractor shall hold Owner and its representatives, agents and employees harmless for any loss sustained by the Contractor of its equipment, tools, supplies, materials and other property of Contractor whether owned or leased.

6. **Additional Insureds:** Commercial General Liability, Umbrella Liability and Comprehensive Automobile Liability insurance policies will name the Owner, and its respective employees, agents and representatives as additional insureds. Certificates of Insurance showing such coverages and additional insureds, along with copies of appropriate additional insured endorsements will be filed with the Owner on or before the execution of the Agreement. At any time requested by the Owner, the Contractor will provide to the Owner a copy of any of the aforementioned policies, and any endorsements or amendments thereto.

7. **Contractor's pollution liability insurance:** N/A

8. **Notice of Cancellation**: The Contractor shall provide written notification to the Owner of the cancellation or expiration of any insurance required by this Exhibit. The Contractor shall provide such written notice within five (5) business days of the date the Contractor is first aware of the cancellation or expiration or is first aware that the cancellation or expiration is threatened or otherwise may occur, whichever comes first. Each insurance policy will state that the insurance company agrees to investigate and defend the insured against all claims for damages to the extent that all alleged damages might be covered by insurance.

9. **Contractors and Contractors Insurance**: Contractor shall require that each Contractor and sub-contractor under contract with the Contractor comply with the

insurance requirements above, except that a Contractor or sub-contractor that provides no professional services for any Project shall not be required to provide Professional Services Liability Insurance. Before permitting any of its Contractors or sub-contractors to perform any Services, Contractor shall obtain a certificate of insurance from each such Contractor and sub-contractor evidencing that such Contractor or sub-contractor, as applicable, has obtained the required minimum insurance and has added those entities as additional insureds with respect to the Commercial General Liability, umbrella liability, and Commercial Automobile Liability insurance, and all other insurances as required herein. All policies of Contractors and sub-contractors shall include a waiver of any right of subrogation of the insurers thereunder against Contractor, the Owner and the other Additional Insureds.

INSURANCE REQUIREMENTS FOR SUBCONTRACTORS

The Contractor shall ensure that all tiers of their subcontractors shall procure and maintain insurance in like form and amounts including the Additional Insured requirements, as set forth above. Copies of the certificates of insurance must be provided to the Town prior to the subcontractor entering the jobsite.

CERTIFICATES ON INSURANCE & POLICY ENDORSEMENTS

Original, completed Certificates of Insurance must be presented to the Town prior to contract issuance, and must name the Town as an additional insured. The Contractor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration of any policy. Should any of the above-described policies be cancelled before the expiration date, written notice must be given to the Town 30 days prior to cancellation. ***A copy of the insurance endorsement naming the Town as an additional insured must also be provided to the Finance Director along with copies of the endorsements within the policy naming the Town as an additional insured.*** Required limits are scheduled out below:

REQUIRED LIMITS

		(Minimum Limits)
General Liability*	Each Occurrence	$1,000,000
	General Aggregate	$5,000,000
	Products/Completed Operations Aggregate	$5,000,000
	Personal and ADV Injury	$1,000,000
	Damage to Rented Premises	$ 300,000
	Medical Expense (any one person)	$ 10,000
Auto Liability*	Combined Single Limit	
	Each Accident	$1,000,000
	Aggregate	$1,000,000
Umbrella*	Each Occurrence	$5,000,000
Excess Liability)	Aggregate	$5,000,000
Contractor's Pollution Liability Insurance	Each Occurrence / Aggregate	N/A
Workers' Compensation and Employers' Liability	WC Statutory Limits EL Each Accident	$500,000
	EL Disease Each Employee	$500,000
	EL Disease Policy Limit	$500,000

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BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned, _____

_____ as Principal; and _____

_____ as Surety, are hereby held and firmly bound

unto the _____, in the penal sum of _____

Dollars ($_____) lawful money of the United States of America to be paid to the

Said _____, as liquidated damages for the payment of which sum, well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____, 201_____

The condition of the above obligation is such that whereas the Principal has submitted to the _____, a certain Bid (Proposal), attached hereto and hereby made a part hereof, to enter into a contract in writing for the Construction of *Spellman Park Tennis Court Renovations Project, Stonington, CT.*

NOW THEREFORE,

(a) if said Bid shall be rejected, or in the alternate,

(b) if said Bid shall be accepted and the Principal shall execute and deliver a contract in the form of contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then, this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by and extension of the time within which the Principal may accept such Bid; and said Surety does hereby waive notice of any such extension.

(SEAL)

_____
Notary Public

_____(L.S.)

By _____
Title

_____
Surety

*By _____
Attorney-in-Fact

Signed and Sealed in the Presence of:

_____

_____

*Important: Furnish proof of authority of officers or agents of Surety to this document.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS,

That _____

_____

of _____, as Principal hereinafter called Principal, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto the TOWN OF STONINGTON, CT as Obligee, hereinafter called the Obligee, in the full penal sum of

_____ Dollars ($_____)

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT WHEREAS said Principal has entered into a certain written contract with said Obligee, dated the _____ day of _____, 200 ___ for the Construction of *SPELLMAN PARK TENNIS COURT RENOVATION PROJECT, STONINGTON, CT* which contract, together with all Contract Documents now made or which may hereafter be made in extension, modification or alternation thereof, any hereby referred to, incorporation in and made a part of this bond as though herein fully set forth.

NOW, THEREFORE, if the said Principal shall well and truly keep, perform and execute all the terms, conditions and stipulations of said contract according to its provisions on his or its part to be kept and performed and shall indemnify and reimburse the obligee for any loss that it may suffer through failure of the Principal to faithfully observe and perform each and every obligation and duty imposed upon the Principal by the said contract, at the time and in the manner therein specified, then this obligation shall be null and void, otherwise it shall remain and be in full force and effect.

PROVIDED, HOWEVER, that any alterations which may be made in the terms of said contract or in the work done or to be done under it, or the giving by the Obligee of any extension of time for the performance of said contract or any other, shall not in any way release the Principal and/or the Surety, or either of them, their representative, heirs, executors, administrators, successors or assigns from liability hereunder, notice to the Surety or Sureties of any such alteration, extension or forbearance being hereby specifically and absolutely waived.

AND PROVIDED FURTHER that no action, suit or proceeding shall be had or maintained against the Surety on this instrument unless the same be brought or instituted and process served upon the Surety within three years from the expiration of the guaranty period provided in the contract, whether the work be completed by the Principal, Surety, or Obligee.

PERFORMANCE BOND, Cont.

IN WITNESS WHEREOF, the said Principal and Surety have SIGNED AND SEALED this instrument this _____ day of _____, 201___.

Attest:

_____
Principal

_____ By: _____

_____
Surety

_____ By: _____

Approved as to form and correctness

Important: Attach herewith proof of authority of officers or agents to sign bond.

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that _____
_____
of _____, as Principal hereinafter called Principal, and _____, a Corporation, organized and existing under the laws of the State of _____, as Surety, hereinafter called Surety, are held and firmly bound unto the **Town of Stonington, CT.** as Obligee, hereinafter called the Obligee, in the full penal sum of
_____
($_____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE OBLIGATION IS SUCH THAT WHEREAS said Principal has entered into a certain written contract with said Obligee, dated the _____ day of _____, 200_____, which written contract provides for the Construction of *the SPELLMAN PARK TENNIS COURT RENOVATION PROJECT, STONINGTON, CT.*

Which contract, together with all plans and specifications now made or which hereafter be made in extension, modification of alteration thereof, are hereby referred to, incorporated in and made part of this bond as though herein fully set forth.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay for all labor and materials furnished to himself or his subcontractors for use in the prosecution of the work and used therein, then this obligation to be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed, pursuant to the provision of Section 49-41 of the General Statutes of the State of Connecticut, Revision of 1958, and Sections 49-42 and 49-43 of the 1961 Supplement to the General Statutes; and the rights and liabilities hereunder shall be determined and limited by said sections to the same extent as if they were copies at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have SIGNED AND SEALED this instrument this _____day of _____, 20 ___.

Attest:

_____
Principal

_____ By _____

LABOR AND MATERIAL PAYMENT BOND, Cont.

Attest:

_____
Surety

_____ By _____

Approved as to form and correctness

Important: Attach herewith proof of officers or agents to sign Bond.

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Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 22-33879

Connecticut Department of Labor
Wage and Workplace Standards

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: KBA#21006.00 Project Town: Stonington
State#: FAP#:
Project: Renovation to Spellman Park Tennis Court

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	38.27	34.47
2) Carpenters, Piledrivermen	35.57	25.65
2a) Diver Tenders	35.57	25.65
3) Divers	44.03	25.65
03a) Millwrights	36.32	26.81
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	54.0	22.90
4a) Painters: Brush and Roller	36.42	22.90
4b) Painters: Spray Only	39.42	22.90
4c) Painters: Steel Only	38.42	22.90

4d) Painters: Blast and Spray	39.42	22.90
4e) Painters: Tanks, Tower and Swing	38.42	22.90
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)	40.75	30.47+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	38.17	38.02 + 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)	45.83	33.50
----LABORERS---- -		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	32.0	24.40
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	32.25	24.40
10) Group 3: Pipelayers	32.5	24.40
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	32.5	24.40
12) Group 5: Toxic waste removal (non-mechanical systems)	34.0	24.40
13) Group 6: Blasters	33.75	24.40
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	33.0	24.40

Group 8: Traffic control signalmen	18.0	24.40
Group 9: Hydraulic Drills	32.75	24.40
----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	34.23	24.40 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	33.26	24.40 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	33.26	24.40 + a
15) Form Erectors	33.59	24.40 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	33.26	24.40 + a
17) Laborers Topside, Cage Tenders, Bellman	33.15	24.40 + a
18) Miners	34.23	24.40 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	40.72	24.40 + a

19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	40.52	24.40 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	38.54	24.40 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	41.31	24.40 + a
----TRUCK DRIVERS----(*see note below)		
Two Axle Trucks, Helpers	31.16	28.78 + a
Three Axle Trucks; Two Axle Ready Mix	31.27	28.78 + a
Three Axle Ready Mix	31.33	28.78 + a
Four Axle Trucks	31.39	28.78 + a
Four Axle Ready-Mix	31.44	28.78 + a
Heavy Duty Trailer (40 tons and over)	33.66	28.78 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	31.44	28.78 + a
Heavy Duty Trailer (up to 40 tons)	32.39	28.78 + a
Snorkle Truck	31.54	28.78 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over). (Trade License Required)	50.27	26.80 + a

Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	46.07	26.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	49.91	26.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	49.06	26.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver ($3.00 premium when operator controls hammer).	45.71	26.80 + a
Group 3: Excavator; 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)	44.86	26.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper).	44.42	26.80 + a
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" mandrel)	43.73	26.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	43.73	26.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	43.38	26.80 + 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)	42.99	26.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	42.54	26.80 + 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), Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	42.04	26.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	39.7	26.80 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	39.7	26.80 + a
Group 12: Wellpoint Operator.	39.63	26.80 + a
Group 13: Compressor Battery Operator.	38.97	26.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	37.66	26.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	37.2	26.80 + a
Group 16: Maintenance Engineer.	36.46	26.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	41.39	26.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	38.61	26.80 + 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	26.5	6.5% + 9.00
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	37.1	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

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*

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. For those without internet access, please contact the division listed below.
The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
All subsequent annual adjustments will be posted on our Web Site for contractor access.
Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

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

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

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

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

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

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

As of: April 18, 2022

CONNECTICUT DEPARTMENT OF LABOR

Partner of the American Job Center Network

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.

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.

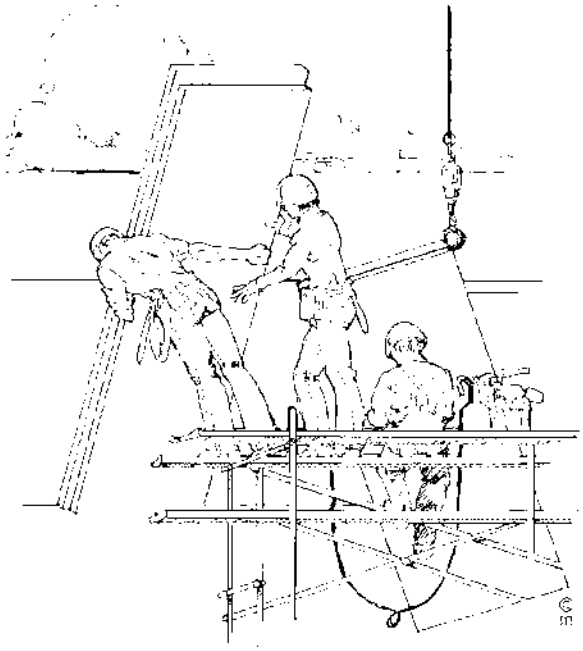
~NOTICE~

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.



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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: _____

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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): _____

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[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	DAY AND DATE							Total ST Hours	BASE HOURLY RATE	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				S	M	T	W	TH	F	S					FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER		
			Trade License Type & Number - OSHA 10 Certification Number	HOURS WORKED EACH DAY							Total O/T Hours	TOTAL FRINGE BENEFIT PLAN CASH								
												$ 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. $							

12/9/2013 *IF REQUIRED
WWS-CP1

*SEE REVERSE SIDE

PAGE NUMBER ______OF

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

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***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*****

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Weekly Payroll Certification For
Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Week-Ending Date:
Contractor or Subcontractor Business Name:

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION	DAY AND DATE							Total ST Hours	BASE HOURLY RATE	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
			Trade License Type & Number - OSHA 10 Certification Number	S	M	T	W	TH	F	S	Total O/T Hours	TOTAL FRINGE BENEFIT PLAN CASH			FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	LIST OTHER		
				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	Week-Ending Date	PROJECT NAME & ADDRESS
1	9/26/09	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
				HOURS WORKED EACH DAY																
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. $							

7/13/2009
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER 1 OF 2

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

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***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 owner 10/2/09

(Signature) (Title) Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

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

Robert Craft owner 10/2/09

(Signature) (Title) Submitted on (Date)

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

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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.

SECTION 01 10 00 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Instructions to Bidders, AIA Document A201, "General Conditions of the Contract for Construction, 2007 Edition as amended, and Division 01 General Requirements are bound herein, are hereby made a part of this Section, and shall be binding on all Contractors and Subcontractors who perform this work.

1.2 SUMMARY

B. This Section includes the following:

1. Project information.
2. Schedule
3. Work covered by the Contract Documents.
4. Work under other contracts.
5. Use of premises.
6. Owner's occupancy requirements.
7. Work restrictions.
8. Specification formats and conventions.

C. Related Sections include the following:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: The Project consists of

"SPELLMAN PARK, TENNIS COURT RENOVATION PROJECT" Stonington, CT.

1. Project Location: Spellman Park, Spellman Drive, Pawcatuck(Stonington), CT 06379. (park is adjacent to Stonington High School)

2. Project consists of new post tension concrete tennis courts, chain link fencing, asphalt walks, athletic lighting and various accessories.

B. Owner's Representative:

Richard Ward
Stonington Recreation
rward@stonington-ct.gov
(203) 458-0001 x207

C. Architect Identification:
Eric Roise, Project Manager
Kaestle Boos Associates, Inc., New Britain, CT
eroise@kaestleboos-architects.com
860-575-3749

1.4 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Generally, the Work includes but is not necessarily limited to:

1. The Work includes selective demolition of the existing asphalt surfacing, chain link fencing, athletic lighting and amenities, as required to accommodate installation of a new post-tension concrete base over existing asphalt courts. Construction includes six new post tensioned concrete tennis courts and two post tension pickleball courts, new fencing, new asphalt walks, perimeter grading, and amenities. Alternates include Athletic lighting, lighting controls and windscreens. Refer to Alternates section and site plans for detailed breakout of alternates.

2. The bid drawings and project manual for **'Spellman Park Tennis Court Renovation Project'** as modified by addenda are hereby incorporated into this specification in whole. All Materials, installation and warranties required for a working, acceptable athletic facility that meets specified codes and requirements shall be included in the bid price.

1.5 ALLOWANCES

A. Bidders shall include in their bid sum an allowance of $20,000 for Electrical work yet to be identified. Use of this allowance will be at the Owner's discretion. This allowance shall be included in the bid sum, and itemized as a line item in the schedule of values. Un-used portions of the allowance shall be credited to the Owner at completion of the project.

1.6 WORK SEQUENCE

A. General: The Contractor shall utilize the proposed Schedule as the basis for a detailed construction schedule, to be submitted to the Owner, Architect, and Owner's Representative for review and approval. The schedule must clearly demonstrate the proper sequencing of construction and relocation activities, and how operational and environmental conditions will be satisfactorily maintained in all occupied spaces.

B. <u>The Sequence of work is to be completed per the following schedule:</u>

a.	Bid documents available	May 4, 2022
b.	Pre-Bid Walkthrough	May 18, 2022
c.	Contractor Questions due by	May 20, 2022
d.	Bids Due	May 26, 2022
e.	Bidder Scope Reviews	May 27, May 30, 2022
f.	Contract Execution (no later than)	Aug 13, 2022

Construction (August 2022, December 2022)	COMPLETED BY:
a. Submittals	July -August, 2022
b. Mobilization/Start Work (no earlier than)	August 15, 2022
c. Substantial Completion	October 15, 2022
d. Project Final Completion	December 1, 2022

1.7 CONTRACTOR USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

B. Use of Site: Confine operations to areas within Contract limits indicated. Do not disturb portions of the Project site beyond areas in which Work is indicated.

1. Confine the parking of workmen's and construction vehicles, and the storage of construction materials to a designated on site staging area determined by the Architect and Owner. Contractor Access, staging and parking shall be from existing parking and west of existing courts. **Entire parking area adjacent to this gate shall be made available for court employee parking, equipment and materials staging.**
2. Keep driveways and entrances clear and available to Owner, Owner's employees, and emergency vehicles at all times. Staging at access ways may be required in order to permit completion of the work of this Project. Do not use these areas for parking or storage of materials.
3. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
4. Do not use school driveways or parking areas for delivery, staging or parking.
5. Employees may not enter school buildings without permission and a valid COREY background check as required by school policy.

C. Site Security: Continuously maintain the security of the site and the Work. Cooperate with the Owner in particularly sensitive areas where security and special safeguards are required.

1. Provide security guards or patrols as necessary for adequate protection of the interests of the Contractor, Owner, and the general public on the site, or in public ways around the site.

2. Ensure that all gates and other openings are secured at the end of each work day.

3. Ensure property signage is installed to signify the project areas is closed.

1.8 OWNER OCCUPANCY

A. Completion Requirements: Timely completion of the project is critical. Aggressive construction scheduling and careful monitoring of crucial path milestones cannot be overemphasized.

B. Partial Owner Occupancy: Owner will occupy the remainder of School and park sites during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise directed by authorities having jurisdiction.

1. Maintain access to existing walkways, driveway, concession building, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner, and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner and Architect of activities that will affect Owner's operations.

1.9 MATERIALS OWNERSHIP

A. All debris and excess fill or earth materials shall become property of the contractor and promptly removed from the site and disposed of in a legal manner.

1.10 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, except otherwise indicated.

1. Extended, Holiday & Weekend Hours:
   as Approved by Owner: (8:00 am to 6:00 pm maximum weekend or holiday)
2. No deliveries or arrivals shall happen between 7-8 a.m. or 2-2:45 p.m. on weekdays while school is in session.
   a. First day of school September 6, 2022
3. The Owner may restrict certain days when no work can occur on site.
   (e.g. testing days, events, etc)

1.11 CODES, STANDARDS AND PERMITS

A. Contractor is responsible for coordinating and obtaining required town building permits (if any).

B. All work under this contract shall conform to all codes and standards in effect as of the date of receipt of Bids which are applicable to this Project. All work shall further conform to specific requirements and interpretations of local authorities having jurisdiction over the Project, These Codes, standards, and authorities are referred to collectively as "the governing codes and authorities", and similar terms, throughout the Specifications. Determination of applicable codes and standards and of the authorities having jurisdiction, shall be the responsibility of each Contractor, as shall be the analysis of all such codes and standards in regard to their applicability to the Project for the purposes of determining necessary construction to conform to such code requirements, for securing all approvals and permits necessary to proceed with construction, and to obtain all permits necessary for the Owner to occupy the facilities for their intended use. In the case of conflicts between the requirements of different codes and standards, the most restrictive or stringent requirements shall be met.

C. The codes that were used in the design of the Project are as follows:

1. State of Connecticut State Building Code
2. National Fire Protection Association (NFPA) codes and standards.
3. Architectural Access Board 521 CMR, as amended (AAB)
4. The Americans with Disabilities Act, Title II, including ADA Regulations.
5. ADA Standards for Accessible Design, 28 CFR 36 (7-1-94 Edition) ADA Accessibility Guidelines (ADAAG).
6. Section 504, Rehabilitation Act 1973 including 504 Regulations.
7. Uniform Federal Accessibility Standards, 41 CFR 101-19.6.
8. National Federation of State High School Associations
9. CT Association of Athletic Directors
10. CT Interscholastic Athletic Conference

D. Code Enforcement and Approvals: Secure the general building permit for the work. Conform to all conditions and requirements of the permit and code enforcement authorities. Provide names and license numbers of its responsible representatives to complete application for permit.

1.12 SPECIFICATION FORMATS AND CONVENTIONS

A. These Specifications with the accompanying Drawings are intended to describe and illustrate all material, labor, and equipment necessary to complete 'Spellman Park Tennis Court Renovation Project' at Spellman Park, Pawcatuck (borough of Stonington), Connecticut.

B. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

C. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

3. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
4. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

D. In general, the Specifications will describe the "quality" of the work and the Drawings, the "extent" of the work. The Drawings and Specifications are cooperative and supplementary, however, and each item of the work is not necessarily mentioned in both the Drawings and the Specifications. All work necessary to complete the project, so described, is to be included in this Contract.

E. In case of disagreement between Drawings and Specifications, or within either document itself, the Architect shall construe the Documents to require the better quality or greater quantity of work for the Owner that can reasonably be construed therefrom. Any work done by the Contractor without consulting the Architect, when the same requires a decision, shall be done at the Contractor's risk.

1.13 SOCIAL SECURITY TAXES

A. The Contractor and each Subcontractor shall pay the taxes measured by the wages of all their employees as required by the Federal Social Security Act all amendments thereto, and accept the exclusive liability for said taxes. The Contractor shall also indemnify and hold the Owner, and its respective officers, agents and servants, and the Architect harmless on account of any tax measured by the wages aforesaid of employees of the Contractor and his Subcontractors, assessed against the Owner under authority of said law.

1.14 UNEMPLOYMENT INSURANCE

A. The Contractor and each Subcontractor shall pay unemployment insurance measured by the wages of his employees as required by law and accept the exclusive liability for said contributions. The Contractor shall also indemnify and hold harmless the Owner, and the Architect on account of any contribution measured by the wages of aforesaid employees of the Contractor and his Subcontractors, assessed against the Owner under authority of law.

1.15 OCCUPATIONAL SAFETY AND HEALTH ACT

A. The Contractor shall comply with the requirements of the Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, including all standards and regulations which have been promulgated by the Governmental Authorities which administer such Acts and said requirements, standards and regulations are incorporated herein by reference.

1. The Contractor shall comply with M.G.L. Chapter 306 of the Acts of 2004, which requires that everyone employed at the job site to complete a course in construction safety and health approved by the U.S. Occupational Safety and Health Administration, known as the "OSHA-10 hour course".

B. The Contractor shall comply with said regulations, requirements and standards and require and be directly responsible for compliance therewith on the part of his agents, employees material men and Subcontractors; and shall directly receive and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of his agents, employees, material men or Subcontractors failing to so comply.

C. The Contractor shall indemnify the Owner and Architect and save them harmless from any and all losses, costs and expenses, including fines and reasonable attorney's fees incurred by the Owner, the Construction Manager and Architect by reason of the real or alleged violation of such laws. Ordinances, regulations and directives, Federal, State, and Local, which are currently in effect or which become effective in the future, by the Contractor, his Subcontractors or material men.

1.16 PREVAILING WAGES

A. The Contractor shall comply with the requirements of the Connecticut General Statutes Section 31-53 Prevailing Wage Law and file certified wage rates with payment applications per this specification and the Prevailing Wages sections included herein.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01 10 00

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SECTION 01 22 00 — UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

B. Abbreviations: The following abbreviations for units of measurement are used in unit prices:

1. C.Y.: cubic yard
2. S.Y.: square yard
3. S.F.: square foot
4. L.F.: linear foot
5. EA.: each
6. LB.: pound

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead and profit.
1. Unit price amounts are net changes in the Contract Sum for additional work and include the Contractor’s and any Subcontractor’s amount for overhead and profit.
2. For deleted work, the net credit to the Contract Sum shall be 10% less.

B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

C. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Provide the following unit prices as listed on the Bid Form:

1. Mass Earth Excavation:

   a. Description: Mass Earth Excavation including the completion of the excavation, formation and compaction of the subgrade, and the disposal of surplus or unsuitable material according to Division 31 Section “Earth Moving.”

   b. Unit of Measurement: C.Y.

2. Granular Fill:

   a. Description: Granular fill (in place) including compaction according to Division 31 Section "Earth Moving.”

   b. Unit of Measurement: C.Y.

3. Processed Aggregate:

   a. Description: Processed Aggregate (in place) including compaction according to Division 31 Section “Earth Moving.”

   b. Unit of Measurement: C.Y.

4. Geotextile Fabric

   a. Description: Geotextile fabric, including manufacturing, shipping, and installation according to Division 33 Section "Field Subdrainage System."
   b. Unit of Measurement: S.Y.

5. 10’ High Galvanized Chain-Link Fencing:

   a. Description: Contractor shall provide the additional cost for the materials, labor, and other items necessary for the installation of a complete fencing system including, but not limited to excavation, footings, posts, caps, fabric, top and bottom rails, tension rods, ties and repair of disturbed areas, according to Division 32 sections.
   b. Unit of Measurement: L.F.

6. Post Tensioned Concrete pavement

   a. Description: Contractor shall provide the additional cost for the materials, labor, and other items necessary for the installation of Post Tensioned Concrete as shown on **detail #5 sheet L4.01**. Including base material, vapor barrier, tennis surfacing and all accessories and reinforcement. according to Division 32 sections.
   b. Unit of Measurement: 10 S.Y.

7. Asphalt walk pavement (Single Course)

   a. Description: Contractor shall provide the additional cost for the materials, labor, and other items necessary for the installation of a single course asphalt walk pavement **as shown on detail #7 sheet L4.01.** Including excavation, gravel base, asphalt, testing and compaction, according to Division 32 sections.
   b. Unit of Measurement: S.Y.

END OF SECTION 01 22 00

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SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: ATHLETIC LIGHTING & CONTROLS (SOUTH):
Contractor shall provide the NET cost (add) for the materials, labor, and other items necessary for providing and installing Athletic Lighting and controls for lighting the southern 5 courts. Alternate shall include 4 athletic lighting poles (T3, T4, T5, T6), fixtures, wiring, controls, control pad, cabinet and handholes. Include control cabinet, service connections, panels and all wiring and accessories to provide a working tennis court lighting system. All accessories shall be sized to accommodate additional lighting as outlined in Alternate #2. Refer to Site Plans and appropriate specification sections.
(note: empty conduit and trenching included under base bid).

B. Alternate No. 2: ATHLETIC LIGHTING (NORTH):
Contractor shall provide the NET cost (add) for the materials, labor, and other items necessary for providing and installing Athletic Lighting and controls for lighting the northern 3 courts. Alternate shall include 2 athletic lighting poles (T1, T2), fixtures, wiring, controls, and handholes. Include all wiring and accessories to provide a working tennis court lighting system. Refer to Site Plans and appropriate specification sections.
This alternate depends on the work included under alternate #1 and cannot be taken without taking Alternate #1 also.
(note: empty conduit and trenching included under base bid).

C. Alternate No. 3: ADD: WIND SCREENS AND GRAPHICS
Contractor shall provide the addition cost for the materials, labor, and other items necessary for providing and installing a 8’ HT. Windscreen and graphics on north and east sides of courts (except gates). Provide full graphic 2 color 6’ ht. text “STONINGTON’ over entire length of windscreen (one each side). Refer to Division 32 specification section ‘Exterior Improvements.

END OF SECTION 01 23 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:

1. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, as follows:

1. "Architect's Supplemental Instruction" (ASI) form, included at end of Part 3, is an Owner/Architect-initiated supplemental instruction.

a. Architect's Supplemental Instructions, including attachments, will be issued to the contractor electronically via email, in the form of a "portable document file" (.PDF).

1.4 CONTRACTOR REQUEST FOR INFORMATION

A. Contractor-Initiated Requests for Information: If clarification is required to the Contract Documents, the Contractor may submit a "Request for Information" (RFI) to the Architect. This request will be responded to by the Architect with a "Response to Request for Information" (RRFI) form.

1. RFI forms shall be submitted in a typewritten, standardized format, including title and description, and sequentially numbered.
2. Submit RFI, including attachments, electronically in the form of a "portable document file" (.PDF).
3. RFI forms are not to be submitted as requests for shop drawing approval. Comply with requirements in Division 01 Section "Submittal Procedures."
4. "Response to Request for Information" (RRFI), included at the end of Part 3, will be issued in response to Contractor's Request for Information (RFI).

a. A Response to Request for Information (RRFI), including attachments, will be issued to the contractor electronically via email, in the form of a "portable document file" (.PDF).
b. If the RRFI directs the Contractor to carry out the Work with no change in Contract Sum or Contract Time, but the Contractor anticipates a change associated with the Work, the Contractor must submit to the Architect in writing within 5 days of receipt of the RRFI, the reason for the anticipated change in Contract Sum and/or Contract Time. A change in Contract Time must be submitted with a revised CPM Schedule in accordance with Division 01 Section "Construction Progress Documentation."

B. The Contractor shall review any RFI's submitted by Subcontractors prior to submission to the Architect to ensure such RFI's are not already clearly and unambiguously answered in the Contract Documents.

1. The Contractor shall pay for the Architect's time and expenses for reviewing RFI's which are already clearly answered or inferable from the Contract Documents in accordance with the Architect's standard rates. Such payments will be paid by the Contractor through the Owner.

1.5 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. "Proposal Requests" (PR) included at the end of Part 3, including attachments, will be issued to the contractor electronically via email, in the form of a "portable document file" (.PDF).
2. Proposal Requests issued by the Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by first submitting a "Request for Information" (RFI) to Architect. This request will be responded to by the Architect with a "Response to Request for Information" form, wherein the Contractor may submit a Change Order Proposal.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made; and the labor hours for each class of labor at the hour rate. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

5. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Change Order Proposal Form: Use CSI Form 13.6A, “Change Order Request (Proposal),” with attachments CSI Form 13.6D, “Proposal Worksheet Summary,” and Form 13.6C, “Proposal Worksheet Detail,” or similar document acceptable to Architect, for Change Order Proposals.

1. Submit Change Order Proposals (COP), including attachments from vendors and subcontractors and the initiating document, electronically in the form of a “portable document file” (.PDF).
2. Each Change Order Proposal is to include reference to the initiating document (PR, RRFI, etc.), a title and description, and be sequentially numbered.
3. “Response to Change Order Proposal” (RCOP), included at the end of Part 3, will be issued in response to Contractor’s Change Order Proposal (COP).

a. A Response to Change Order Proposal (RCOP) will be issued to the Contractor electronically via email, in the form of a “portable document file” (.PDF).
b. Following review of a COP by the Architect, if corrections are required prior to inclusion in a Change Order, resubmit revised COP with revision number and include all backup documentation and the initiating document.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records of time and material for work required by the Construction Change Directive.

1. After completion of change, submit a Changer Order Proposal associated with the Work of a Construction Change Directive, including an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
2. The Architect will prepare a Change Order upon approval by the Architect and Owner of a Change Order Proposal.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FORMS

A. The following forms referenced in this Section are attached:

1. ASI – Architect's Supplemental Instructions, 1 page.
2. RRFI – Response to Request for Information, 1 page.
3. PR – Proposal Request, 1 pageRCOP – Response to Change Order Proposal, 1 page.

END OF SECTION 01 26 00

KAESTLE BOOS
associates, inc

ASI - ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS

PROJECT
City, State

KBA #

CONTRACTOR: (or CM)	**GENERAL CONTRACTOR OR CM** Address City, State, Zip Attn: M.	**ASI NO. (3 digit)-(2 digit)**
ISSUED BY:	(Name and Credentials) (Project Architect, Landscape Architect, etc.)	**COPIES TO:** ☐ KBA – CT/MA ☐ Owner ☐ Official
DATE:	(Month, Day, Year)	☐ Consultant ☐ Consultant

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time. If the Contractor believes that additional cost or time is involved, the Contractor shall make Claims as provided in the General Conditions of the Contract.

Description: ASI Title

Description of work……

Attachments: Sketches, Bulletins, etc.

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KAESTLE BOOS
associates, inc

P R – P R O P O S A L R E Q U E S T

PROJECT NAME
PROJECT NAME
Town, State

KBA # _____
Page: 1 of 1

CONTRACTOR: (or CM)	**GENERAL CONTRACTOR OR CM** Address City, State, Zip Attn: M.	**PR NO. (3 digit)-(2 digit)**
ISSUED BY:	(Name and Credentials) (Project Architect, Landscape Architect, etc.)	**COPIES TO:** ☐ KBA – CT/MA ☐ Owner ☐ Official
DATE:	(Month, Day, Year)	☐ Consultant ☐ Consultant

Please submit an itemized quotation for changes in the Contract Sum and/or Contract Time for proposed modifications to the Contract Documents described herein. Notify the Architect in writing of the date on which you anticipate submitting your proposal.
THIS IS NOT A CHANGE ORDER, CONSTRUCTION CHANGE DIRECTIVE, OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.

Description: PR Title

Response …….

Attachments:

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KAESTLE BOOS
associates, inc

RCOP – RESPONSE TO CHANGE ORDER PROPOSAL

PROJECT NAME
PROJECT NAME
Town, CT

KBA # _____
Page: 1 of 1

CONTRACTOR: (or CM)	**GENERAL CONTRACTOR OR CM** Address City, State, Zip Attn: M.	**RCOP NO. (3 digit)-(2 digit)**
ISSUED BY:	(Name and Credentials) (Project Architect, Landscape Architect, etc.)	**COPIES TO:** ☐ KBA – CT/MA/NH ☐ Owner ☐ Official
DATE:	(Month, Day, Year)	☐ Consultant ☐ Consultant

☐ **Change Order Proposal has been reviewed by the Architect and is recommended to the Owner for approval.**

☐ **Change Order Proposal is rejected.**

- ☐ *Owner will not require the Contractor to proceed with the Work described in Change Order Proposal*
- ☐ *Work described in Change Order Proposal is required by the Contract Documents.* ☐ *Refer to comments below.*

☐ **Revise and resubmit Change Order Proposal.**

- ☐ *Overhead/Profit is incorrect.* ☐ *Labor and material costs breakdown is insufficient.*
- ☐ *Backup documentation is insufficient.* ☐ *Refer to comments below.*

Description: **RCOP Title**

Response……

Attachments: COP No.

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KAESTLE BOOS
associates, inc

RRFI – RESPONSE TO REQUEST FOR INFORMATION

PROJECT NAME
PROJECT NAME
Town, CT

KBA #_____
Page: 1 of 1

CONTRACTOR: (or CM)	**GENERAL CONTRACTOR OR CM** Address City, State, Zip Attn: M.	**RRFI NO.: (3 digit)-(2 digit)**
ISSUED BY:	(Name and Credentials) (Project Architect, Landscape Architect, etc.)	**COPIES TO:** ☐ KBA – CT/MA ☐ Owner ☐ Official
DATE:	(Month, Day, Year)	☐ Consultant ☐ Consultant

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time. If the Contractor believes that additional cost or time is involved, the Contractor shall make Claims as provided in the General Conditions of the Contract.

Description: RRFI Title

Response……

Attachments: RFI #

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SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for procedural requirements governing handling and processing of allowances.
2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 01 Section "Unit Prices" for administrative requirements governing use of unit prices.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.
c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment. No payment shall be processed until schedule of values has been submitted and approved by the Architect.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section. For major trades with line item values exceeding $25000, provide separate line items for identifiable units of work within such trade with a value not exceeding $25000. Provide separate line items for labor and material.

1. Identification: Include the following Project identification on the Schedule of Values:

   a. Project name and location.
   b. Name of Architect.
   c. Architect's project number.
   d. Contractor's name and address.
   e. Date of submittal.

2. Submit draft of AIA Document G702 and AIA Document G703 Continuation Sheets.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Change Orders (numbers) that affect value.
   d. Dollar value.

      1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum. Include the following mandatory line items:

   a. Mobilization
   b. Demobilization
   c. Builders Risk Insurance
   d. Bonds
   e. Scheduling
   f. Construction Photographic Documentation
   g. Field Engineering
   h. Daily Site Cleanup
   i. Safety Program
   j. Full-Time Project Manager
   k. Full-Time Project Superintendent
   l. Dumpsters

   General Contract O & P (not to be included in each line item).

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing.

7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

    1. In order to expedite monthly payment during the course of the Project, the Contractor shall review with the Architect a preliminary draft of each Application for Payment before final copies of the Application are formally submitted. The draft copy shall be typed and include the application date and application number. The draft copy shall include the total of each column and extension of each row on the Application as if this was the formal submission. The cover sheet shall include the Original Contract Sum and a summary of Changes to the Contract Sum, retainage, and payments to date as if this was the formal submission.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders issued before last day of construction period covered by application.

    a. List each Change Order at the end of the Schedule of Values. Under each Change Order number, list each Change Order Proposal by number with a brief description of the Work and its value.

E. Transmittal: Submit five signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination Drawings.
2. Contractor’s use of Architect’s CAD files.
3. Administrative and supervisory personnel.
4. Project meetings.

B. The Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to specific Subcontractors.

C. Related Sections include the following:

1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
2. Division 01 Section "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with subcontractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
5. No claim for extra compensation of extension of Contract time will be allowed for conditions resulting from a lack of said coordination.

B. Prepare memoranda outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

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

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of subcontractors 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. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

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

1.4 CONTRACTOR'S USE OF ARCHITECT'S DIGITAL DATA FILES

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing Coordination Drawings.

1. At the Contractor’s written request, Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Coordination Drawings, subject to the terms and conditions of the Contractor’s use of CAD Files Agreement attached after this Section.

a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
b. The following digital data files will by furnished for each appropriate discipline:
1) Site Layout Plans.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

B. Key Personnel Names: Within 7 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.

Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

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

1.6 CRIMINAL OFFENDER RECORD INFORMATION

A. CORI Reports: Each and every person in attendance at Project site must agree to complete the CORI Request Form if requested by the school.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct weekly meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
2. Agenda: Prepare the meeting agenda, and distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved and distribute the meeting minutes to everyone concerned, including the Owner and Architect within 3 days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner, Project Manager, and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner and Architect; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for requests for information (RFIs).
g. Procedures for testing and inspecting.
h. Procedures for processing Applications for Payment.
i. Distribution of the Contract Documents.
j. Submittal procedures.
k. Preparation of Record Documents.
l. Use of the premises and existing building.
m. Work restrictions.
n. Owner's occupancy requirements.

o. Responsibility for temporary facilities and controls.
p. Parking availability.
q. Office, work, and storage areas.
r. Equipment deliveries and priorities.
s. First aid.
t. Security.
u. Progress cleaning.
v. Working hours.

3. Minutes: The Architect will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. The Contract Documents.
b. Options.
c. Related requests for information (RFIs).
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: The Contractor shall distribute minutes of the meeting to everyone concerned, including the Owner, Project Manager, and Architect within 3 days of the meeting.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Schedule weekly progress meetings. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

      1) Review schedule for next period.

   b. Review present and future needs of each entity present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.
      13) Status of correction of deficient items.
      14) Field observations.
      15) Requests for information (RFIs).
      16) Status of proposal requests.
      17) Pending changes.
      18) Status of Change Orders.
      19) Pending claims and disputes.
      20) Documentation of information for payment requests.

3. Minutes: The Architect will record and distribute the meeting minutes.

E. Coordination Meetings: Schedule Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of the Contractor**,** each subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Schedule Updating: Revise Contractor’s Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
   c. Review present and future needs of each contractor present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.
      13) Change Orders.

3. Reporting: The Contractor shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FORMS

A. The following forms referenced in this Section are attached:

1. CAD Files Agreement, 1 page.

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SPELLMAN PARK
STONINGTON, CT

TENNIS COURT
RENOVATION PROJECT
KBA #21006.00

CAD FILES AGREEMENT

At your request, Kaestle Boos Associates, Inc. ("KBA") will provide electronic files for your convenience and use in the preparation of shop drawings related to the construction of the **SPELLMAN PARK TENNIS COURT REPLACEMENT PROJECT, STONINGTON, CT** subject to the following terms and conditions.

KBA's electronic files are compatible with AutoCAD Autodesk Architectural Desktop 2021. KBA makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

Data contained on these electronic files is part of KBA's instruments of service and shall not be used by you or anyone else receiving this data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project; however, they are not to be used in place of Contractor's shop drawings. Any other use or reuse by you or by others, will be at your sole risk and without liability or legal exposure to KBA. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against KBA, its officers, directors, employees, agents or subconsultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless KBA from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files are not contract documents. Significant differences may exist between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. KBA makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed contract documents prepared by KBA and electronic files, the signed contract documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, KBA reserves the right to remove all indicia of its ownership and/or involvement from each electronic display.

KBA will furnish you electronic files of the following drawing
sheets: Base plan, layout and materials and grading plans

A lump sum fee of $000.00 will be charged for this service. Payment must be remitted to KBA prior to delivery of the electronic files. The lump sum fee will be charged for each occurrence.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by KBA and KBA makes no warranties, either express or implied, of merchantability or fitness for any particular purpose. In no event shall KBA be liable for any loss of profit or any consequential damages.

_____ _____ _____

CONTRACTOR – (PRINTED NAME) **CONTRACTOR – (SIGNATURE)** **DATE**

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SECTION 01 33 00–SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 01 Section "Closeout Procedures" for submitting warranties.
4. Divisions 02 through 33 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making

corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

   a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

3. Format: Arrange the following information in a tabular format:

   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action; informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Architect's final release or approval.
   g. Scheduled date of fabrication.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals, except as permitted in Division 01 Section “Project Management and Coordination” for use in preparing coordination drawings.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

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

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

   1. Initial Review: Allow two weeks for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow two weeks for review of each resubmittal.

    a. Resubmittals will be reviewed no more than two times at the Owner's expense. Resubmittals which fail to comply with Contract requirements will be reviewed at the Contractor's expense, based on an hourly rate of $75 per hour, not to exceed $600 for each subsequent submittal.
    b. The Owner reserves the right to deduct said reimbursement from the Contractor's application for payment on a monthly basis.

D. Identification: All submittals cover pages shall utilize the project Submittal Review Stamp included with in the Project Manual. Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name and address of Contractor.
    e. Name and address of supplier.
    f. Name of manufacturer.
    g. Number and title of appropriate Specification Section.
    h. Drawing number and detail references, as appropriate.
    i. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

    a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

5. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

    a. Transmittal Form: Provide locations on form for the following information:

        1) Revise list below to suit Project.
        2) Project name.
        3) Date.
        4) Destination (To:).
        5) Source (From:).
        6) Names of subcontractor, manufacturer, and supplier.
        7) Category and type of submittal.

8) Submittal purpose and description.
9) Specification Section number and title.
10) Drawing number and detail references, as appropriate.
11) Transmittal number, numbered consecutively.
12) Submittal and transmittal distribution record.
13) Remarks.
14) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name of Contractor.
e. Name of firm or entity that prepared submittal.
f. Names of subcontractor, manufacturer, and supplier.
g. Category and type of submittal.
h. Submittal purpose and description.
i. Specification Section number and title.
j. Specification paragraph number or drawing designation and generic name for each of multiple items.
k. Drawing number and detail references, as appropriate.
l. Location(s) where product is to be installed, as appropriate.
m. Related physical samples submitted directly.
n. Indication of full or partial submittal.
o. Transmittal number.
p. Submittal and transmittal distribution record.
q. Other necessary identification.
r. Remarks.

F. Options: Identify options requiring selection by Architect.

G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "Approved" or "Approved as Corrected."

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating "No Exception Taken" or "Make Corrections Noted" taken by Architect.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files.

a. All submittals shall be sent to both of the following email addresses:
1) Eric Roise, Project Manager
eroise@kaestleboos-architects.com
2) Luke McCoy, Principal
lmccoy@kba-architects.com

b. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. Submit Product Data before or concurrent with Samples.
5. Submit Product Data in one of the following formats:

    a. PDF electronic file.
    b. Five paper copies of Product Data, unless otherwise indicated. Architect will return four copies. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Schedules.
    f. Design calculations.
    g. Compliance with specified standards.
    h. Notation of dimensions established by field measurement.
    i. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

4. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing

color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

G. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

H. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

I. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

J. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

K. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.

3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

N. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

O. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

P. Material Safety Data Sheets (MSDSs): Submit information as required by law.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Provide “Combined Contractor/KBA Inc. Submittal Review Stamp” attached after this Section.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. "Approved": The portion of Work covered by the submittal may proceed provided it complies with the Contract Documents.
2. "Approved as Corrected": The portion of Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal, and with the Contract Documents.
3. "Not Approved" or "Revise and Resubmit": Revise or prepare a new submittal in accordance with notations; resubmit. Do not proceed with that portion of the Work covered by the submittal.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Incomplete or partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.3 FORMS

A. The following form referenced in this Section is attached:

1. Combined Contractor/KBA Inc. Submittal Review Stamp, 1 page.

END OF SECTION 01 33 00

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COMBINED CONTRACTOR AND K.B.A. INC. SUBMITTAL REVIEW STAMP

CONTRACTOR: _____

PROJECT: _____

PARAGRAPH. NO.: _____ SUBMITTAL NO.: _____

CONTRACTOR HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND FIELD CONSTRUCTION CRITERIA AND HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED IN THIS SUBMITTAL WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS AND RECOMMENDS APPROVAL BY THE ARCHITECT/ENGINEER.

BY: _____ DATE: _____

TO BE FILLED IN BY THE CONTRACTOR

KAESTLE BOOS ASSOC. PROJECT NO.: KBA# 18030.00

ARCHITECTS/ENGINEERS
DATE RECEIVED STAMP:

TO BE FILLED IN BY KAESTLE BOOS ASSOC., INC.

COMMENTS MADE ON THE SUBMITTALS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS. REVIEWING IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE; FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; AND FOR COORDINATION OF THIS WORK WITH THE WORK OF ALL TRADES.

ACTION STAMP:

Upon award and execution of the Construction Contract with the Owner, Kaestle Boos Associates shall provide a digital version of the Submittal Review Stamp for the Contractors use.

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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections
2. Divisions 02 through 48 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

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

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

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated,

qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

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

E. 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 industry standards.

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

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

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

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

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

1.4 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

A. Qualification Data: 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.

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

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that 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 reinspecting.

D. 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. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. 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.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency 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.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
g. Payment for preconstruction testing is the responsibility of the Contractor.

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

1.7 QUALITY CONTROL

A. Contractor Responsibilities: Where quality-control services are indicated, Contractor shall engage a qualified testing agency to perform these services.

1. Contractor will furnish Architect with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made by the Contractor.
3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be the responsibility of the Contractor at no additional cost to the Owner.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. 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.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

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

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

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

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

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

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

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. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

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 01 40 00

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SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied

directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section specifies requirements for temporary utilities, support facilities, and security and protection facilities.

1. Temporary utilities required include but are not limited to:

   a. Water service and distribution.
   b. Temporary electric power and light.
   c. Storm and sanitary sewer.

2. Temporary support facilities required include but are not limited to:
   a. Dewatering facilities and drains.
   b. Temporary enclosures.
   c. Temporary Project identification signs.
   d. Waste disposal services.
   e. Construction aids and miscellaneous services and facilities.

3. Security and protection facilities required include but are not limited to:
   a. Barricades, warning signs, lights.
   b. Enclosure fence for the construction area.
   c. Environmental protection.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum and paid for by the Contractor unless explicitly stated otherwise in the Contract Documents. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water Service: Water from Owner's existing water system is not available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service: Electric power from Owner's existing system is not available for use without metering and without payment of use charges. Provide connections and extensions of services, or portable electric power as required for construction operations.

D. Owners' sanitary facilities shall not be utilized by the contractor. Contractor is to provide sanitary facilities for the duration of the project, including the regular cleaning and protection of such facilities.

1.5 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police and Fire Department rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", OSHA Part 1926, Construction Safety and Health Regulations, and NECA Electrical Design Library "Temporary Electrical Facilities."

1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

1.6 PROJECT CONDITIONS

A. Temporary Utilities (if required): Prepare a schedule indicating dates for implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

C. Prevention of Fire: Take all necessary precautions for the prevention of fire during construction. Keep the area within the contract limits orderly and clean and promptly remove combustible rubbish from the site.

1. Store combustible materials on the site only as established in the Contractor's approved Safety Plan.

2. Comply with all suggestions, official recommendations, and lawful requirements of the local fire department regarding fire protection.

D. Provide and maintain in good working order under all conditions, suitable and adequate fire protection equipment and services.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

1. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
2. For fences, barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.

C. Paint: Comply with requirements of Division 09 Section "Painting."

1. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.

D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

E. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete bases for supporting posts.

2.2 EQUIPMENT

A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. Fire Extinguishers: Provide hand-carried, portable UL-rated, class “A” fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class “ABC” dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the work, at no additional cost to the Owner.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.
3. Make all necessary arrangements and pay for the services of police officers and firefighters at the prevailing wage for such services as may be required for traffic control or fire watch for the performance of any portion of the Work.

B. Parking: Use the Contractor Staging/Work area, as indicated in the Phasing Drawings, for construction personnel.

C. Project Identification and Temporary Signs: Prepare one project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood. Do not permit installation of unauthorized signs.

D. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

1. Provide sufficient quantity of dumpsters at strategic locations within the Contract limit lines for collection of waste from the work of all subcontractors on site.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence and gates in a manner that will prevent people and animals from easily entering site except

by entrance gates. Existing gates and Fence can be utilized for this purpose. Supplement existing fence as required to fully secure site. Remove temporary site enclosure fence when the need has ended or prior to substantial completion.

1. Provide vehicle gates at site entrances.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.
3. Make all necessary arrangements with Municipal Police department when regular or off-duty police officers will be needed for traffic control for site operations.

B. Temporary Enclosures: The Contractor shall provide all temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.

1. Install tarpaulins securely, with fire-retardant-treated wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
2. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.

C. Protect all new finished surfaces against possible damage from operations under this Contract.

1. Restore or replace all surfaces that are damaged by operations under this Contract to their original condition, to the satisfaction of the Architect, at no additional expense to the Owner.

D. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials, inflammable materials and volatile liquids in containers in fire-safe containers and locations under the Contractor’s control and supervision, or without adequate ventilation and fire protection.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
4. Do not permit accumulation of flammable rubbish to remain in the building overnight.
5. Observe strict safety precautions and provide supervision of welding operations, burning with a torch, combustion type temporary heating units, and similar sources of fire ignition.
6. No gasoline may be stored in or close to the field at any time.
7. Comply with requirements of local Fire Department, obtain Hot Work Permit for each day required, and pay all fees and other charges.

3.4 SITE CLEANING AND MAINTENANCE

A. Perform an inspection of the site, including areas outside of the Site boundaries, with the Owner's Representative present, prior to the start of any Work, to determine the existing conditions.

B. The Contractor shall take all necessary precautions to prevent the spreading of dirt and dust throughout the area of the Work. During demolition and all other work, take to contain dust and other debris from the Work within the limits of the site under the Contractor's control. Promptly clean up all dirt, dust and debris escaping from the work areas or dropped from vehicles traveling to and from the Work.

1. Equip all vehicles used for transportation to, and removal of material from the site with covers, maintained in good condition, adequate to contain dust and debris within lawful acceptable limits.
2. Provide facilities for preventing the spread of objectionable matter outside the site areas through washing of vehicles and vehicle wheels; decontamination of vehicles transporting hazardous waste containing materials such as asbestos, lead, or other matter; and by all other means necessary.
3. When excavation begins, provide a 24' x 60', or larger as indicated, tire cleaning surface at each construction entrance. Provide adequate drainage and maintain surface for the duration of construction.
4. Contractor shall keep all pavements and areas outside the area of the construction clean of dirt and debris.

C. Prior to Substantial Completion, remove all spots, stains, dirt and dust from all surfaces, including areas within other buildings and any portion of property of others, which were the result of the work of this project, to the satisfaction of the Architect.

1. Requirements for final cleaning are contained in Division 01 Section, Closeout Procedures."

D. Repair any damage to the site, the property of others or the Owner's equipment caused by the Contractor or its Subcontractors, at no additional cost to the Owner.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. Temporary facilities provided by the Contractor shall be removed by the Contractor.

D. As a condition of the Architect's certification of Substantial Completion, restore site areas of the site damaged by work under this Contract to their condition existing at the start of the work, unless otherwise directed by the Architect.

END OF SECTION 01 50 00

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SUBSTITUTION REQUEST
(After the Bidding Phase)

DATE: _____

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ KBA Project Number:_____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No. _____

Installer: _____ Address: _____ Phone: _____

History: [ ] New Product [ ] 2-5 years old [ ] 5-10 years old [ ] More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

[ ] Point-by-point comparative data attached – REQUIRED BY ARCHITECT

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: [ ] No [ ] Yes; Explain: _____

_____

Savings to Owner for accepting substitution: _____ ($ _____)

Proposed substitution changes Contract Time: [ ] No [ ] Yes [Add] [Deduct] _____ days.

Supporting Data Attached: [ ] Drawings [ ] Product Data [ ] Samples [ ] Tests [ ] Reports [ ] _____

SUBSTITUTION REQUEST DATE: _____

(After the Bidding Phase)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for addition costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all aspects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

_____

_____

ARCHITECTS'S REVIEW AND ACTION

[ ] Substitution approved - Make submittals in accordance with Specification Section 013300.
[ ] Substitution approved ad noted - Make submittals in accordance with Specification Section 013300.
[ ] Substitution rejected – Use specified materials.
[ ] Substitution Request received too late – Use specified materials.

Signed by: _____ Date: _____

Additional Comments: [ ] Contractor [ ] Subcontractor [ ] Supplier [ ] Manufacturer [ ] Architect [ ] _____

_____

_____

_____

_____

_____

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. Related Sections include the following:
1. Division 01 Section "Submittal Procedures" for submitting surveys.
2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Qualification Data: For land surveyor and professional engineer.

B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

C. Progress Project Surveys: Submit one .pdf copy signed the by land surveyor and one AutoCAD (2019 or newer) copy for each of the following project milestone:
1. Court Base, after installation of all sand and court aggregate base materials and prior to installation of the forming, reinforcement and concrete materials, on a 20’ grid. Include topography, utility and installed structures, fencing, and all other items within 10’ of outside edge of proposed concrete.

D. Final As-Built Project Surveys: Submit two hard copies signed by land surveyor and one AutoCAD (2019 or newer) copy. At a minimum, survey shall include the following:
1. Topography, 1’ contours (20’ gird across completed track and field)
2. All court lines and markings
3. Utility and stormwater structures, including visible piping within structures

4. New underground utilities
5. Concrete anchor curbing, fencing, and all other structures and items within 10' outside of limit of work for the project.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional, land surveyor who is registered in the State of Connecticut to practice in the State of Connecticut and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

a. Description of the Work.
b. List of detrimental conditions, including substrates.
c. List of unacceptable installation tolerances.
d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing and finished work prior to proceeding with additional work.

4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Project Manager promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, building structures, drainage structures, piping (inverts and elevations), grading, fill and topsoil placement, utility slopes, and all facility improvements as part of the project.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Identification: Identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 7’-8” in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
4. All anchors and fasteners used on the exterior of the building and where dampness and corrosion can reasonably be anticipated to be corrosion resistant.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

1. All paint used on products to comply with federal regulations controlling the use of volatile organic components. (VOCs).

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials

specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

B. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken surfaces.

END OF SECTION 01 73 00

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 01 Section "Execution" for progress cleaning of Project site.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
4. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
5. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Divisions 02 through 48 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents. Substantial Completion shall not be issued until all warranties, service agreements, and similar documents are submitted and approved.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.
6. Provide final as-built survey as required under Section 01 73 00 – Execution.
7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
8. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
9. Complete startup testing of systems and performance testing of all surfaces.
10. Submit test/adjust/balance records.
11. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
15. Submit list of subcontractors, service providers, and principal vendors including contact information where they can be reached for emergency service.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Within 30 days of original request for inspection, request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, and within thirty (30) days of issuance of Certificate of Substantial Completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit all updates to the final as-built survey for work completed after issuance of the Certificate of Substantial Completion
4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Architect.
d. Name of Contractor.
e. Page number; 1 of x.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Schedule of Warranties: Arrange a Schedule of Warranties in columnar format and include the Specification Section number and title, product name or description, and duration of the warranty. Indicate whether the warranty is by Installer, Manufacturer, or both. Under each of these headings, indicate whether the warranty includes labor only, material only, or both labor and material. Whenever there are differing warranty responsibilities between Installer and Manufacturer, list the responsibilities and duration of each separately.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Remove labels that are not permanent.
e. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

f. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

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SECTION 02 41 00 — DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 DESCRIPTION OF WORK

A. All labor, material and equipment necessary to complete all phases of demolition work as shown on the Drawings, as specified, and as can be reasonably implied from Drawings, Specifications, and field conditions.

B. Filling of depressions resulting from demolition activities.

C. Removal of utilities, drainage structures, drainage piping, pavement, handrails, playscapes, sidewalks and curbing.

D. Removal and disposal of resulting demolition materials.

E. Leaving site clean and ready for clearing required to install new construction.

F. Maintaining streets and walks during demolition and the cleaning of them of debris resulting from demolition.

G. Temporary shoring, bracing and framing where necessary for demolition work.

H. Protecting adjoining construction that is to remain.

I. Patching required as a result of demolition.

J. Securing and maintaining in force the required permits and the payment of associated fees.

K. Complying with all regulations for street and walk access and protection and fire access.

1.3 RELATED WORK DESCRIBED ELSEWHERE

A. Section 31 20 00 – Earth Moving;

B. Section 31 25 00 – Erosion and Sedimentation Controls.

1.4 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. State of Connecticut Basic Building Code;

2. State of Connecticut Department of Health Services;

3. State of Connecticut Department of Energy & Environmental Protection;

4. Utility companies having jurisdiction;

5. **Town of Stonington, CT.**

1.5 JOB CONDITIONS

A. Traffic:

1. Conduct demolition operations and the removal of debris in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities;

2. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction;

3. Provide alternate, adequately signed, routes around closed or obstructed traffic ways.

4. Ensure the safe passage of persons around the area of demolition;

B. Conduct operations to buildings, to prevent damage or injury to adjacent buildings, structures, other facilities and persons;

C. Provide shoring, underpinning, excavation supports as necessary to protect structures and all adjacent properties;

D. If applicable, provide and maintain fire protection.

E. Promptly repair damages, to adjacent facilities caused by demolition operations. Replace glass breakage immediately.

F. Maintain existing utilities not scheduled to be removed, keep in service, and protect against damage during demolition operations;

1. Repair and, if necessary replace, services damaged as result of demolition;

2. Do not interrupt existing utilities if encountered serving occupied or used facilities, except when authorized in writing by authorities;

3. Provide temporary services during interruptions to existing utilities, as acceptable to the governing authorities;

4. The contractor shall arrange for any utility shut-offs required. The Contractor shall disconnect and seal utilities before starting demolition operations. Construction related work required by the Utility Companies is included in this Contract. Do not start demolition work until utility disconnections have been completed and verified in writing.

B. Protection:

1. Erect barriers, fences, guard rails, enclosures, chutes, and shoring to protect personnel, structures, and utilities remaining intact.

PART 2 – PRODUCTS

2.01 None required by this Section.

PART 3 – EXECUTION

3.1 PREPARATION

A. Review all limits of fencing, sedimentation control and other construction barriers with Owner and Engineer prior to installation.

B. Arrange for, and verify termination, of utility services to include removing meters and capping lines, if necessary.

C. Where trafficways will be closed or obstructed the Contractor shall provide alternate routes, including adequate signing and striping.

D. Prior to demolition, removal or abandonment of items within paved areas to remain the Contractor shall sawcut the bituminous concrete pavement.

E. The Contractor shall obtain all necessary permits from agencies having jurisdiction.

3.2 DEMOLITION

A. Use water sprinkling, temporary enclosures, and other suitable methods to limit to the lowest practical level the amount of dust and dirt rising and scattering in the air;

1. Comply with governing regulations pertaining to environmental protection and pollution;

2. Do not use water when it may create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Remove below grade construction completely and fill below-grade areas and voids from resulting from demolition of structures and pavements.

1. Use satisfactory materials consisting of stone, gravel, and sand, free from debris, trash, materials, roots, and other organic matter.

C. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen materials, roots and other organic matter.

D. Place fill materials in horizontal layers generally not exceeding 6" in loose depth. Compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, unless subsequent excavation for new work is required.

1. After fill placement and compaction, grade surface to meet adjacent contours and to provide flow to surface drainage structures.

2. Where indicated on the Drawings demolish and remove foundation walls and retaining walls to an elevation two feet below existing or proposed finish grade, whichever is lower.

3. Filling will be in conformance with the requirements of Section 31 20 00 – Earth Moving.

E. Cap, plug with brick and mortar, or remove, as indicated, pipes and other conduits abandoned due to demolition. Holes left in existing structures left from the removal and/or demolition of piping shall also adequately plugged and capped. Coordinate all utility abandonment with affected utility. Perform utility in accordance with requirements of affected utility. Repair trenches and perform work within R.O.W. in accordance with the Town's and utility company's requirements.

3.3 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from the site debris, rubbish, and other materials resulting from demolition operations;

1. Storing or burning of materials on the site will not be permitted.

B. Transport materials of demolished structures and legally dispose of off-site in conformance with regulations of Department of Energy and Environmental Protection, and other regulating agencies as applicable.

C. Remove demolition debris daily.

D. Manner of disposal shall comply with all applicable local, state, and federal regulations.

END OF SECTION

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY`

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes in accordance with the Contract Documents and applicable Codes. The work shall include the following:

1. Footings.
2. Foundation walls, Pads, curbing, walls and stairs.

B. Related Sections include the following:

1. Division 31, Section "Structural Fill"
2. Division 31, Section "Earthwork"

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast furnace slag, and silica fume; subject to compliance with requirements.

1.4 QUALITY ASSURANCE

A. Concrete work shall conform to all requirements of A.C.I. 301-16 "Specifications for Structural Concrete ", published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by the Supplemental Requirements below.

B. Concrete supplier and Contractor shall certify that they are familiar with the above reference standard, and a copy shall be available on the job. A.C.I Standard 301-16 is available from American Concrete Institute, P.O. Box 9094, Farmington Hills, Michigan 48333-9094.

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

E. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

G. Concrete Testing Service: **Contractor** engages a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I.

I. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

J. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

   a. Contractor's superintendent.
   b. **Contractor's** independent testing agency responsible for concrete design mixtures.
   c. Ready-mix concrete manufacturer.
   d. Concrete subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures,

curing procedures, construction contraction and isolation joints, and joint-filler strips, semi rigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Submit reinforcing steel placing drawings for all reinforced concrete footings, buttresses, piers, walls and tie beams.

1. Shop drawings for the reinforcement detailing, fabricating, bending and placing concrete reinforcement shall comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". All walls shall be drawn in elevation with all reinforcing included in the elevation including corner bars, dropped bars at column and door pockets and openings. The elevations shall be drawn to a minimum of ¼" =1'-0".

2. Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. "SCHEDULING OF REINFORCING IS PROHIBITED"

3. Subsequent submissions of shop drawings shall be dated and numbered and shall have all revision clearly noted with clouding of each revision.

4. All reinforcing shall be properly labeled and indicated in elevations.

D. Qualification Data: For Installer, manufacturers, and testing agency.

E. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

F. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.

4. Steel reinforcement and accessories.
5. Repair materials.

G. Field quality-control test and inspection reports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Store materials protected from exposure to harmful weather conditions and at a temperature above 40° Fahrenheit.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

ACI 301-16
ACI 117

2.2 CONCRETE

A. Concrete compressive strength for foundation walls and footings shall have:
1. Compressive strength = 4000 psi minimum at 28 days.
2. Slump = 4” +/- 1”
3. Air Content = 6 to 8% for all walls, footings and slabs exposed to freezing temperatures.

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

C. Cementitious Materials:
1. Portland Cement: ASTM C 150, Type I/II gray
2. Flyash ASTM C618 Class C and ACI318-05
3. Sand ASTM C33 SSD

D. Normal-Weight Aggregates: ASTM C 33. Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years’ satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse Aggregate Size: ¾” nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

E. Water: ASTM C94 and potable.

F. Air-Entraining Admixture: ASTM C 260

1. For Footings, foundation walls, column piers and buttresses and all other concrete exposed to freeze/thaw action. - Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494
2. Retarding Admixture: ASTM C 494
3. Water-Reducing and Retarding Admixture: ASTM C 494
4. High-Range, Water-Reducing Admixture: ASTM C 494
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494
6. Plasticizing and Retarding Admixture: ASTM C 1017

H. Do not use admixtures containing calcium chloride. All concrete shall contain a water-reducing and densifying admixture such as MASTER BUILDERS POZZOLITH or an approved equal as follows:

1. All admixtures shall be incorporated as an integral part of the mix design.

2. Admixture shall be manufactured by a firm having not less than 10 years experience in manufacturing and field testing of the product

I. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85° and 90° F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes.
2. When air temperature is above 90° F, reduce mixing and delivery time to 60 minutes.

2.3 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

a. High-density overlay, Class 1 or better.
b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
c. Structural 1, B-B or better; mill oiled and edge sealed.
d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.4 STEEL REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

B. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.5 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.8 CURING MATERIALS

A. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

B. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.9 MISCELANEOUS RELATED MATERIALS

A. Grout for leveling plates shall be “Five Star" non-shrink, nonmetallic grout as manufactured by Five Star Products, or approved equal.

B. Bonding Agent: ASTM C 1059, Type II, non-re-dispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Give the RDP at least 2 working days’ notice before placing concrete. Execution shall be in accordance with A.C.I. STANDARD 301-16, except as noted below.

B. Employ a licensed land surveyor to check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before structural steel erection work proceeds. Contractor shall submit to the RDP the anchor bolt survey with all discrepancies between elevations, locations, conditions, etc., shown on the drawings and those actually encountered in the field noted on the survey. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steel work have been agreed upon with RDP.

3.2 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.
2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.3 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install dovetail anchor slots in concrete structures as indicated.

3.4 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by RDP.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Discharge concrete from mixer within 1 1/2 hours of batching.

3.8 CONCRETE PROTECTING AND CURING

A General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Formed Surfaces: Cure formed concrete surfaces, including foundation walls and footings and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Cure concrete according to ACI 308.R-16, by one of the following methods contractor shall be responsible for utilizing an appropriate curing method to achieve the required strength, moisture levels and other parameters.

1. After placing and finishing, use one or more of the following methods to preserve moisture in the concrete:

a. Ponding, continuous fogging, or continuous sprinkling;
b. Application of mats or fabric kept continuously wet;
c. Continuous application of steam (under 150°F);
d. Application of sheet materials conforming to ASTM C171;
e. Curing and Sealing Compound

3.9 COLD AND HOT WEATHER CONCRETE:

A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40°F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
3. Loss of slump, flash set, or cold joints due to temperature of concrete as placed will not be acceptable. When temperature of concrete exceeds 90°F, obtain acceptance by the RDP of proposed precautionary measures to be undertaken. When temperature of steel reinforcement, embedments, or forms is greater than 120°F, fog steel reinforcement, embedments, and forms with water immediately before placing concrete. Remove standing water before placing concrete.

3.10 EMBEDDED ITEM INSTALLATION

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.11 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Grout beam bearing plates and column leveling plates after they are set to true levels.

B. Install Sika Latex acrylic bonding agent in strict accordance with manufacturer’s recommendations, including but not limited to the removal of all foreign materials by mechanical means such as chipping or sandblasting, and dampening the surface with clean water before installation.

C. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brushcoat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

E. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor will engage a qualified testing agency to perform tests and to submit reports and the Owner will engage a qualified firm to perform Special Inspections per the Statement of Special Inspections. The Statement of Special Inspections document will be implemented by the RDP.

B Inspections:

1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 60 cu. yd. or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064 one test hourly when air temperature is 40°F and below and when 80°F and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31.

   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

   b. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

   c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to RDP, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28

days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
11. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

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SECTION 26 05 43 - UNDERGROUND DUCTS AND RACEWAYS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Rigid nonmetallic duct.
   2. Duct accessories.
   3. Polymer concrete handholes and boxes with polymer concrete cover.

1.3 DEFINITIONS

A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.

B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.

C. Duct Bank:

   1. Two or more ducts installed in parallel, with or without additional casing materials.
   2. Multiple duct banks.

D. GRC: Galvanized rigid (steel) conduit.

E. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Duct-bank materials, including spacers and miscellaneous components.
   2. Duct, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
   3. Accessories for handholes.
   4. Detectable warning tape.

B. Shop Drawings:

1. Precast or Factory-Fabricated Underground Utility Structures:

    a. Plans, elevations, sections, details, attachments to other work, and accessories.
    b. Duct entry provisions, including locations and duct sizes.
    c. Frame and cover design and manhole chimneys.

2. Factory-Fabricated Handholes Other Than Precast Concrete:

    a. Dimensioned plans, sections, and elevations, and fabrication and installation details.
    b. Duct entry provisions, including locations and duct sizes.
    c. Cover design.
    d. Grounding details.

1.5 INFORMATIONAL SUBMITTALS

A. Coordinate layout and installation of ducts, manholes, and handholes with final arrangement of other utilities, site grading, and surface features as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into manholes, and handholes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Engineer.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Comply with ANSI C2.

C. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

PART 2 - PRODUCTS

2.1 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct**:** Type EPC-80-PVC and Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. ARNCO Corp.
2. Beck Manufacturing.
3. CANTEX INC.
4. CertainTeed Corporation.
5. Condux International, Inc.
6. Crown Line Plastics.
7. ElecSys, Inc.
8. Electri-Flex Company.
9. Endot Industries Inc.
10. IPEX USA LLC.
11. Lamson & Sessions.
12. Manhattan/CDT.
13. National Pipe & Plastics.
14. Opti-Com Manufacturing Network, Inc (OMNI).
15. Spiraduct/AFC Cable Systems, Inc.

C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

D. Solvents and Adhesives: As recommended by conduit manufacturer.

2.2 DUCT ACCESSORIES

A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Allied Tube & Conduit; a part of Atkore International.
b. CANTEX INC.
c. Carlon; a brand of Thomas & Betts Corporation.
d. IPEX USA LLC.
e. PenCell Plastics.
f. Underground Devices, Inc.

B. Detectable Warning Tape: Comply with requirements for underground-line warning tape specified in Division 31 Section "Earth Moving."

2.3 POLYMER CONCRETE HANDHOLES AND BOXES WITH POLYMER CONCRETE COVER

A. Description: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Quazite: Hubbell Power Systems, Inc.
2. Armorcast Products Company.
3. NewBasis.
4. Oldcastle Enclosure Solutions.

C. Standard: Comply with SCTE 77. Handholes and bores to be Tier 22 unless otherwise noted.

D. Color: Green.

E. Configuration: Units shall be designed for flush burial and have closed bottom unless otherwise indicated.

F. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.

G. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

H. Cover Legend: Molded lettering, as indicated for each service**.**

I. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.

J. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering duct for secure, fixed installation in enclosure wall.

K. Handholes shall have factory-installed inserts for cable racks and pulling-in irons.

2.4 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Strength tests of complete boxes and covers shall be by an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
2. Testing machine pressure gages shall have current calibration certification, complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of duct, duct bank, manholes, and handholes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of duct and duct-bank entrances into manholes and handholess with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

C. Clear and grub vegetation to be removed, and protect vegetation to remain according to Section 311000 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 311000 "Site Clearing."

3.2 UNDERGROUND DUCT APPLICATION

A. Duct for Electrical Cables: Type EPC-80-PVC RNC, direct-buried unless otherwise indicated.

3.3 EARTHWORK

A. Excavation and Backfill: Comply with Division 31 Section "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restoration: Replace area after construction vehicle traffic in immediate area is complete.

C. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."

E. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures according to "Cutting and Patching" Article in Section 017300 "Execution."

3.4 DUCT AND DUCT-BANK INSTALLATION

A. Where indicated on Drawings, install duct, spacers, and accessories into the duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

B. Install duct according to NEMA TCB 2.

C. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.

D. Curves and Bends:

1. Direct-Buried Duct Banks: Use manufactured GRC long radius sweeps for all bends with a radius of 6 ft. or less. All other bends are to be heated long radius sweeps. Conduit is not to be distorted.
2. Concrete-Encased Duct Banks: Use heated long radius sweeps. Conduit is not to be distorted.

E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.

F. End Bell Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch duct, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell, without reducing duct slope and without forming a trap in the line.
2. Grout end bells into structure walls from both sides to provide watertight entrances.

G. Terminator Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to terminator spacing 10 feet from the terminator, without reducing duct line slope and without forming a trap in the line.

H. Building Wall Penetrations: Make a transition from underground duct to GRC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-GRC transition. Install GRC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

I. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

J. Pulling Cord: Install 200-lbf- test nylon cord in empty ducts.

K. Direct-Buried Duct and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct. Comply with requirements in Division 31 Section "Earth Moving" for preparation of trench bottoms for pipes less than 6 inches in nominal diameter.
2. Depth: As indicated on the Contract Documents.
3. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
4. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
5. Install duct with a minimum of 3 inches between ducts for like services and 24 inches between power and communications duct.
6. Install manufactured GRC long radius sweeps for stub-ups, at poles and equipment and at building entrances, and at changes of direction in duct.

    a. Couple RNC duct to GRC with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
    b. Stub-ups to Outdoor Equipment: Extend concrete-encased GRC horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

        1) Stub-ups shall be minimum 4 inches above finished floor and minimum 3 inches from conduit side to edge of slab

    c. Stub-ups to Indoor Equipment: Extend concrete-encased GRC horizontally a minimum of 60 inches from edge of wall. Install insulated grounding bushings on terminations at equipment.

        1) Stub-ups shall be minimum 4 inches above finished floor and no less than 3 inches from conduit side to edge of slab

7. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Section 312000 "Earth Moving" for installation of backfill materials.

    a. Place minimum 8 inches of sand as a bed for duct. Place sand to a minimum of 12 inches above top level of duct.

L. Warning Tape: Bury detectable warning tape approximately 18 to 24 inches directly over all direct-buried ducts and duct banks. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width

over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally. Refer to Division 31 Section "Earth Moving."

3.5 INSTALLATION OF HANDHOLES OTHER THAN PRECAST CONCRETE

A. Install handholes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use handhole extension if required to match depths of duct, and seal joint between handhole and extension as recommended by manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone as indicated on the drawings and compacted per Division 31 Section "Earth Moving."

C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.

E. Field cut openings for duct according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch- long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.
3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Prepare test and inspection reports.

3.7 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump.

1. Sweep floor, removing dirt and debris.
2. Remove foreign material.

3.8 AS-BUILT DRAWINGS

A. The Contractor shall provide as-built drawings including as-built ties and markups on a monthly basis. As work progresses, all construction activities shall be documented. The record documents shall include:

1. All demolition and abandonment of underground utilities and structures.
2. Location, elevation and type (size and quantity) of installed underground utilities. Location, elevation and type of existing exposed utilities during installation of new work.
3. The Contractor shall hire the services of a surveyor licensed in the state where the work is being performed to determine parameters stated above or complete work and record the results and update the electronic files. As-builts shall include lateral and vertical (depth) locations of all utilities at 50-foot increments as well as swing ties.
4. Document installation with photographs in digital format, especially but not limited to, field joints, bedding material, concrete encasement, duct spacers, sweeps, bends and connections to manholes and buildings.
5. Final documents (drawings and electronic files in AutoCAD format, latest edition) shall be submitted to the designated Owner's Representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's Representative. The final record set (hard copy and the electronic files) shall be submitted to the Owner's Representative.

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SECTION 26 56 68 – EXTERIOR TENNIS LIGHTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.

B. Work covered by this section is affected by ALTERNATE bid items. Refer to Division 1 Section 'Alternates".

C. The purpose of these specifications is to define the lighting system performance and design standards for the Stonington Spellman Courts lighting project using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.

1. The sports lighting will be for the following venues:
   Tennis
   Pickleball

D. The primary goals of this sports lighting project are:

1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Light levels are guaranteed to not drop below specified target values for a period of 25 years.

2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.

3. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Courts should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

1.3 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	**Average Target Illumination Levels**	**Maximum to Minimum Uniformity Ratio**	**Grid Points**	**Grid Spacing**
Tennis (1-3) and (4-6)	50FC	2:1	45	20’ x 20’
Pickleball	40FC	5:1	48	10’ x 10’

B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	**Pole Designation**	**Pole Height**
4	T1-T2 and T5-T6	50’
2	T3-T4	60’

D. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

E. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

100’ From Edge of Courts	**Maximum**
Horizontal Footcandles	≤ .10 FC

F. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.

G. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer’s laboratory with a current accreditation under the National Voluntary

Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

PART 2 PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, ballast and other enclosures shall be factory assembled, aimed, wired and tested.

B. Basis of Design Product: Musco Light Structure System with TLC for LED or approved equal. Owner and Owners representative shall have sole judgement on 'or equal' products. System will include all components necessary for a working, athletic lighting system with controls and maintenance monitoring.

C. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

D. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly.

   a. Square static cast concrete poles will not be accepted.

   b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.

2. Lighting systems shall use concrete foundations. See Section 2.4 for details.

   a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.

   b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or reinforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.

3. Manufacturer will supply all drivers and supporting electrical equipment

a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.

b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.

4. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.

5. All luminaires, visors, and cross-arm assemblies shall withstand 150 mph winds and maintain luminaire aiming alignment.

6. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.4 for further details.

7. Contactor cabinet to provide on-off control.

8. Push-button control unit shall be provided to allow players to turn the lighting system on or off during times allowed by the owner. Once a player pushes the "on" button, the lights will come on for a preset time of 1 minute to 160 minutes. At the end of the specified period, a strobe will start flashing for approximately 3 minutes. During this time, players will be able to push the "on" button again to continue play, or lights will go off. Two units shall be provided by lighting manufacturer. (one for north bank of courts and one for south bank – See Alternates).

9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.

   a. Integrated grounding via concrete encased electrode grounding system.

   b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

10. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following enhanced requirements in addition to the standard durability protection specified above:

    a. Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.

    b. Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

    c. Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

11. Safety: All system components shall be UL listed for the appropriate application.

2.3 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:

1. Electric power: 480 Volt, Single Phase

2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The kW consumption for the field lighting system shall be 21kW, or less.

C. Provide all handholes, enclosures transformers, pads, wiring and accessories necessary for a complete, working lighting system. Locate new control enclosure and pad at approximate location of existing pad and enclosure.

D. Electrical shall utilize existing electrical supply. Enclosures, panels and cabinets shall be sized for full build-out of all six lighting poles (see Alternates)

2.2 CONTROL SYSTEM

A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

C. Dimming: System shall provide for 3-stage dimming (high-medium-low). Dimming with be set via scheduling options (Website, app, phone, fax, email).

D. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

E. The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute “early off” commands by phone. Scheduling tool shall be capable of setting curfew limits.

F. Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

G. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

H. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service.

Mobile application will be provided suitable for IOS, Android and Blackberry devices.

I. Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility

2. Report hours saved by using early off and push buttons by users.

J. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.

K. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.3 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2015 International Building Code. Wind loads to be calculated using ASCE 7-10, an ultimate design wind speed of 140 and exposure category C.

B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).

C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2015 IBC Table 1806.2.

D. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in the state where the project is located are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

PART 3 EXECUTION

3.1 SOIL QUALITY CONTROL

A. It shall be the Contractor’s responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner’s approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of Connecticut for soils other than specified soil conditions;

2. Additional materials required to achieve alternate foundation;

3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 6-8 weeks from receipt of approved submittals and receipt of complete order information.

3.3 FIELD QUALITY CONTROL

A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.

B. Field Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as “guaranteed” on the illumination summary provided by the manufacturer.

2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.

3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.

B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

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SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes the following:

1. Site excavating, grading, filling, backfilling, compacting, and preparing sub-grades for the entire project including but not limited to: foundations, footings, retaining walls, slab-on-grade components, site utility lines and structures, walks, pavements, lawns, athletic fields and plantings.
2. Granular fill course for walks, curbs, stairs, and other site improvements.
3. Compacted structural fill where indicated on the Structural Drawings or where required below building areas.
4. Foundation drains where indicated on structural drawings.
5. Processed aggregate for pavements and other improvements.
6. Stone screenings for mow strips, warning tracks, walks softball infields, various athletic surfaces, and other site improvements.
7. Crushed Stone for pavements, under building slabs, footings and around foundation drains, including piping in stone wedges.
8. Sand for jumping pits and athletic field construction.
9. General fill for establishing project sub-grades.
10. Excavation of rock and/or boulders, including replacement with suitable earthwork materials.
11. Removal of encountered unsatisfactory soils, including lawful off-site disposal and replacement with suitable earthwork fill material.
12. Utility bedding material for site utilities.
13. Spreading of stockpiled subsoil at all athletic fields.
14. Construction of pea gravel diaphragm at pavement areas where indicated.
15. Securing trenching permit.

B. Related Sections include the following:

1. Division 01 Section "Temporary Facilities and Controls."
2. Division 01 Section "Temporary Tree and Plant Protection."
3. Division 31 Section "Erosion and Sedimentation Control."
4. Division 31 Section "Trench Excavation and Backfill".
5. Division 31 Section "Site Clearing".
6. Division 31 Section "Dewatering".
7. Division 32 Section "Turf and Grasses".
8. Division 33 Section "Field Subdrainage System".
9. Division 33 Section "Storm Drainage System".

10. Division 26 and 33 Sections for excavating and backfilling buried mechanical and electrical utilities and utility structures.

C. This project is Unclassified –
1. Unclassified excavation shall comprise and include the satisfactory removal and disposal of all materials encountered within the lines and grades shown in the drawings and in the specifications regardless of the nature of the materials, and shall be understood to include but not limited to, earth, topsoil, subsoil, hardpan, fill, foundations, pavements, curbs, piping, footings, bricks, concrete, abandoned drainage and utility structures, debris, and materials classified as unsuitable materials. All excavations and associated backfill within the lines and grades shown in the drawings and in the specifications, except in rock as defined below, shall be included in the base bid.

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and proposed improvements.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil or earthwork products imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Mass Excavation: Excavations more than 8 feet in width and pits more than 30 feet in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Mass Rock or Earth: Excavated material that is greater than 8’ in both length and width.

H. Rock (Mass & Rock): Excavated rock material in beds, ledges, unstratified masses, and conglomerate deposits that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; Caterpillar 325D or equal, equipped with a 42-inch wide, short-tip-radius rock bucket.

2. Mass Excavation: Late-model, track-mounted loader; Caterpillar 963C or equal; or Late-model, track-mounted hydraulic excavator; Caterpillar 325D or equal, equipped with a 42-inch wide, short-tip-radius rock bucket.

I. Boulder: An excavated, individual rock fragment or natural stone with a volume of 1.5 c.y. to 3 c.y. All boulders exceeding 3 c.y. shall be classified as "rock" and shall fall within "mass" or "trench" subcategory based on definitions in this section. Material classified as "Rock" and excavated and paid for shall not be eligible to be classified as "boulder" for additional payment purposes. <u>All excavated boulder material, to be disposed of on-site, or processed for re-use on-site, is not eligible for compensation under allowance and is part of base bid.</u>

J. 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.

K. Subbase Course: Layer placed between the subgrade and base course for pavement or other site improvements.

L. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

M. Trench Rock or Earth: Excavated material from trench excavations that is less than 8' (eight feet) in either length or width.

N. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

O. Form 817: "Standard Specifications for Roads, Bridges, and Incidental Construction", State of Connecticut, Department of Transportation, Form 817", as revised.

P. Unsatisfactory/Unsuitable Soils: Any material generated, excavated and/or collected by earth moving activities or other contract work that does not meet any of the product specifications contained in contract documents.

Q. Zone of Influence (ZOI): the planes extending horizontally away from the bottom edges of footings, utilities and other existing and proposed site improvements for a distance of two feet in all directions, then down and away at 1H:1V (horizontal : vertical) slope to the intersection with suitable native soils.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specifications Sections.

B. Product Data: For the following:

1. Each type of plastic warning tape.
2. Drainage fabric.
3. Separation fabric.

C. Samples: For the following:

1. 50-lb samples, sealed in airtight containers, of each proposed soil material from on-site or borrow sources, for Owner's independent laboratory testing agency. Samples shall be delivered to the site seven (7) calendar days in advance or time planned on incorporating them into the work. Owner's testing lab will confirm submitted test results and compaction curve data.

2. 5-lb sample to Architect's office for visual conformance confirmation.
3. 12-by-12-inch sample of drainage fabric.
4. 12-by-12-inch sample of separation fabric.
5. 4-foot strip of each type of warning tape.

D. Material Test Reports: From an approved qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Complete mechanical/sieve analysis classification according to Form 817 and ASTM D 2487 <u>for every 400 cubic yards of on-site or borrow soil material</u> proposed for fill and backfill. Washed sieve shall be performed for 200 sieve on all materials.
2. Laboratory compaction curve according to ASTM D 1557 for <u>each on-site or borrow soil material</u> proposed for fill and backfill.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.
4. Test sampling shall conform to the requirements of ASTM D-75, and ASTM D-3665.

E. Blasting plan approved by authorities having jurisdiction, for record purposes.

F. Seismic survey agency report, for record purposes.

G. All installation of materials prior to testing and/or review and response by Architect is at Contractor's risk.

1.5 QUALITY ASSURANCE

A. Comply with applicable requirements of NFPA 495, "Explosive Materials Code" and SSHB, Section 120 and State Fire Codes.

B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services:

1. Prepare plan report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
2. Seismographic monitoring services during blasting operations.
3. Prepare a preblast survey of all adjacent properties, including a structural inspection of the buildings and properties and shall include a written and photographic record of existing conditions.
4. Blast operations shall not commence until all reports and plans are received and approved by the Owner and the Architect.

C. Geotechnical Testing Agency Qualifications: An independent testing agency 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.

D. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1, Section "Project Coordination".

1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

E. Testing: Compaction tests will be required by the Owner and will be paid for by the Owner. No specific testing schedule has been established at this time. If tests indicate that density requirements have not been achieved, the Contractor shall continue compacting.

All retesting in these areas shall be paid for by the Contractor. See Division 1, Section “Quality Control Services”. Contractor is required to compensate testing laboratory, directly, for all material test reports.

F. Density and Compaction Testing: The Contractor is responsible to schedule compaction tests and to allow adequate time for the proper execution of said tests.

G. Protect all benchmarks, monuments, and property boundary pins. Replace if destroyed by Contractor’s operations.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated. Note that school operations must be maintained throughout construction.

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active. Contact **Call Before You Dig (1-800-922-4455)** prior to any earthwork or demolition operations.

C. Contractor is responsible to properly obtain a trenching permit per 520 CMR 14.00 from appropriate local or state agency.

1.7 UNIT PRICES

A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following:

1. 12 inches outside of concrete forms at footings.
2. 6 inches outside of minimum required dimensions of concrete cast against grade.
3. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
4. 12 inches outside width and bottom of drainage structures, including catch basins and manholes.
5. Pavements: bottom elevation of the specified subbase course.
6. 6 inches beneath pipe in trenches, and 24 inches wider than inside diameter of the pipe.
7. Planting Areas: 48" below proposed finish elevations area as specified for typical planting installation.
8. Lawn Areas: 18" below indicated finish grades.

B. Boulder Measurement: Volume of all boulders excavated and slated for removal from site. Individual boulders to be measured by method mutually agreed upon by the Contractor and Owner.

C. Limits and measurements do not represent dimensions of excavation requirements mandated by safety and other regulatory agencies. Rock required to be removed to conform to safety regulations will not be measured for payment.

1.8 SUBSURFACE SOIL DATA

A. Only Shallow subsurface testing was performed as part of the project pre-design, All base materials and thicknesses shall be assumed to be as specified in previous construction projects.

B. Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Suitable Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, reclaimed or recycled materials (i.e., asphalt, concrete, glass, etc.), and other deleterious matter. CL, SC, and GC can be used if approved by the Owner's Geotechnical Engineer. (use of recycled asphalt may be permitted for specific soil products as specified and shall be approved for use by Architect)

C. Unsuitable Soils: ASTM D 2487 soil classification groups GC, SC, MH, CH, OL, OH, and PT, or a combination of these group symbols, and any materials that contain reclaimed or recycled materials (i.e., asphalt, concrete, glass, etc.) unless otherwise specified.

D. Unsuitable soils also include suitable soils not maintained by the General Contractor within 2 percent of optimum moisture content at time of compaction.

E. Granular Fill: Form 817 Article M.02.06, Type 'B' is to be used for filling under footings, pavements, and improvements, and subbase under pavements that is required to achieve the rough grades indicated.

1. Provide borrow material as required to meet project specifications.

F. Structural Fill

1. Structural Fill for fill and backfill below building areas and adjacent to foundation walls except where other materials are specified or detailed. Materials shall be clean bank-run or processed gravel free from recycled material, foreign substances (bricks, concrete, asphalt, etc), frozen material, lumps of clay, loam or vegetable matter, be obtained from a single source and shall meet the following grain size gradation:

2.

Sieve Size	Percentage Passing by Weight
3 inches	100
1 ½"	80-100
½"	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0-5 under sidewalks

Structural fill shall have a plasticity index of less than 6 and shall be compacted in maximum 9' loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Fill placed within buildings and within an area extending 5 feet beyond the limits of buildings, including within utility trenches inside buildings, shall consist of Structural Fill.

G. Crushed Stone: Clean, sound material free of debris, waste, frozen materials and organic material conforming to Form 817, Article M.01.01, No. 6 size as indicated on Drawings.

H. Porous fill: 3/8" crushed stone, Clean, sound material free of debris, waste, frozen materials and organic material conforming to, Form 817, Article M.01.01 No. 67.

I. Processed Aggregate: Artificially graded mixture of sound coarse and fine aggregates, containing no more than 15 percent by weight of recycled bituminous concrete. Mixture to be free of debris, waste, frozen materials and organic materials and conform to Form 817, Article M.05.01. . Maximum size of aggregate shall not exceed 2/3 of lift thickness. Broken stone is required; rounded gravel will not be permitted.

J. Processed Gravel for Subbase, Form 817 Article M.02.06, Type 'B' shall be used as a subbase material for paved areas, including but not limited to roadways, parking lots, asphalt berms, reinforced concrete pads, unit pavers, asphalt walks, concrete walks, and curbs.

K. Utility Bedding Material: Sand or sandy soil free of debris, waste, frozen materials and organics with 100 percent passing a 3/8-inch sieve and not more than 10 percent passing a No. 200 sieve or as specifically required by applicable utility authority.

L. Field Stone: Naturally weathered rock between 6” – 18” in width and depth used for the construction of stone walls.

M. General Fill: Material used to establish subgrade elevations may be either:

1. Approved soil material available from excavation on site provided material meets specification for general fill as described below, or approved by Architect prior to placement. Maximum size 6”.
2. Approved material, obtained from off-site, certified to conform to the following grain-size gradation:

SQUARE MESH SIEVES	PERCENT PASSING WEIGHT
6”	100
1”	50-100
# 4	20-100
# 20	10-70
# 60	5-45
#200	0-20

3. All material used for general filling shall be clean, free of clay and organic material and capable of satisfactory compaction.
4. If sufficient approved on-site material is not available to meet site elevations indicated, Contractor shall provide additional approved off-site material at no extra cost to Owner.

N. Modified Rock Fill: M2.02.4

O. Stone Screenings: , Form 817, Article M.01.01 ‘Screenings’.

P. Sand for trenching, bedding, concrete and masonry: ASTM C33-03 ‘Fine Aggregate’ type 2NS.

Q. Sand for Athletic use (exposed sand) shall be rounded, washed river or bank sand conforming to form 817 Article M.05.02-2.0 Sand Cover except material shall 100% pass a number 8 sieve and 0-2% passing the #100 Sieve

R. Subsoil: shall be the existing on site weathered moraine material; typically 12”–24” depth located immediately under the existing topsoil and atop the residual moraine material.

S. Stone: An individual rock fragment or natural stone, with a volume of 0.5 cubic yards to 1.5 cubic yards, obtained from on-site excavation, on-site processing of rock or boulders, or an off-site source. All stone obtained from on-site excavation shall be considered Mass Earth or Trench Earth. All excess stone shall be considered “Unsatisfactory Soils” and shall be legally disposed of off-site.

T. Washed Stone: Crushed stone not to exceed 3”.

2.2 ACCESSORIES

A. Detectable Warning Tape: 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.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Drainage Fabric: Non-woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lb/f; ASTM D 4632.
2. Tear Strength: 40 lb/f; ASTM D 4533.
3. Puncture Resistance: 50 lb/f; ASTM D 4833.
4. Water Flow Rate: 150 gpm per sq. ft.; ASTM D 4491.
5. Apparent Opening Size: No. 50; ASTM D 4751.

C. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 200 lbf; ASTM D 4632.
2. Tear Strength: 75 lbf; ASTM D 4533.
3. Puncture Resistance: 90 lbf; ASTM D 4833.
4. Water Flow Rate: 4 gpm per sq. ft.; ASTM D 4491.
5. Apparent Opening Size: No. 30; ASTM D 4751.

D. Foundation Drains: Foundation drainage pipe and fittings shall be 6" inside diameter, 0.254" minimum wall thickness, PVC Perforated Pipe in accordance with ASTM D2729.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. 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. Refer to Division 31, Section “Sedimentation and Erosion Control”.

D. Provide protective safety barrier around all trees in the work area that are to remain.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Coordinate with project sediment and erosion control requirements.

B. Protect subgrades 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 a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: Obtain written permission from authorities having jurisdiction before bringing explosives to Project site or using explosives on Project site. Secure and pay for all permits as required.

B. Comply with procedures outlined in paragraph "Quality Assurance", sub-paragraph "Seismic Survey Agency", above and Form 817, Section 1.07.08.**.** No overnight on-site storage of explosives is permitted.

1. Do not damage adjacent structures, property, or site improvements or weaken the bearing capacity of rock subgrade when using explosives.

C. Provide minimum 48-hours notice to Owner, Architect, abutting properties, and all affected utilities. No blasting is permitted prior to 8:00 a.m. or after 4:00 p.m. or on Holidays, Saturdays or Sundays without written permission of the Owner. Blasting is NOT permitted while school is in session unless otherwise noted.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of the surface and subsurface conditions encountered, including rock, soil materials, and obstructions. No changes in the Contract Time or contract price will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory materials and rock, replace with satisfactory soil materials.
2. Contractor will not be entitled to additional time to complete the project or additional compensation, when rock removal is required.

B. Rock or Unsuitable materials Excavation Procedures:

1. When, during the process of excavation, rock or unsuitable materials are is encountered as specified herein, the Contractor shall strictly adhere to the following procedures.
2. Such material shall be uncovered and exposed.
3. The Architect and the Owner shall be notified by the Contractor before proceeding further.

4. The Contractor shall not proceed with the excavation of any material claimed as rock or unsuitables until the material has been classified by the Owner's Representative and cross sectioned as specified below.
5. The Contractor shall retain a land surveyor acceptable to both the Owner and the Contractor, to take cross sections of rock before removal of same, and to provide computations of cross sections within payline limits.
6. For unsuitable materials, the Contractor shall excavate down to the limits defined by the Geo-technical engineer, owner or architect and then engage a surveyor to provide the cy measurement necessary to bring the excavation back up to contract payline limits.
7. All quantities and classifications shall be measured as compacted in-place material and not as trucked or stockpiled material and must be verified and documented with Owner's Representative or Architect.
8. Should the Contractor proceed with the excavation without surveyed quantification and classification of the rock, the Contractor shall forfeit the right to payment as rock for the subject material.
9. Rock excavation materials may be used for fill, only as specifically allowed and approved by the Architect, in accordance with the following paragraph "D".

C. All areas where rock is removed must be marked on the as-built Drawings. Obtain approval of the Architect before starting work.

D. If the Contractor intends to utilize excavated rock for site earthwork operations, the Contractor must modify any such material to comply with the specification for the designated specific material, at no cost to the Owner. Boulders may also be modified for use. No material may be used, unless approved by the Architect, prior to placement.

E. Boulder disposal:
1. Limited on-site, above grade use of boulders is required for site improvements. See plans, specifications and details for specific locations, quantities and installation procedures. Contractor shall coordinate with Architect for boulder selection and final placement and facing.
2. On-site, below grade boulder disposal is permitted in locations below meadows and large lawn areas. See plans and coordinate with landscape architect for locations. Contractor shall not deviate from following procedure for on-site, below grade disposal.
   a. Boulders to be buried in areas of fill under lawn and landscape areas only. Contractor to ensure that there are no conflicts with proposed or existing utilities.
   b. Top of Boulders shall have a minimum 4'-0" cover to finish grade
   c. There shall be a minimum distance of 4'-0" between boulders.
   d. Approved fill materials shall be placed between boulders and installed and compacted in compliance with project specifications. Approved fill materials shall be placed above buried boulders in compliance with project specifications.

F. Rock and boulder disposal:
1. All excess rock and boulders remain the property of the Contractor and must be removed from project site and disposed in a legal manner.

3.5 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances and requirements of authorities having jurisdiction to maintain stable excavations.

3.6 SUBGRADE PREPARATION FOR BUILDING FOOTINGS

A. Contractor shall remove all unsuitable soils, including buried peat, topsoil, subsoil, boulders and existing fill under all building footings. Rock shall be cut at a minimum to 12" beneath the bottom of footings to allow for the placement of Structural fill. The contractor shall place a minimum of 6" (12" where rock is found) of structural fill under all footings and piers.

3.7 SUBGRADE PREPARATION FOR BUILDING SLABS

A. Contractor shall remove all unsuitable soils, including buried peat, topsoil, subsoil, boulders and existing fill under all building slabs. Rock shall be cut at a minimum to 24" beneath the bottom of slabs to allow for the placement of Structural fill. Exposed boulders shall be remove from the subgrade and the resulting excavation filled with structural fill. The contractor shall place a minimum of 12" of porous or structural fill under all building slabs.

3.8 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus **[**1 inch**]**. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

3.9 EXCAVATION FOR WALKS AND PAVEMENTS AND SLABS ON GRADE

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades. In locations where existing fill and organics are located below pavements, the existing fill below pavements should be improved before placing the proposed fill by compacting the exposed subgrade in the existing fill using vibratory compactor imparting a dynamic effort of at least 40 kips. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic soil shall be removed and replaced with general fill placed to the bottom of the subbase layer.

3.10 APPROVAL OF SUBGRADE

A. Notify Architect and Owner's Representative when excavations have reached required subgrade.

B. If unsatisfactory soil is present at sub-grade elevation, continue excavation and replace with compacted backfill or fill material as directed.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the work.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades. Conform to Section 170. Subgrade must be approved prior to application of any borrow or fill materials.

D. If it is determined that unsatisfactory soil or excess moisture content is present, continue excavation and replace with compacted free draining backfill or fill material as directed.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect.

F. Proof roll all areas under running track with minimum six (6) passes by vibratory roller with minimum 20 tons of dynamic force.

3.11 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.12 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated/manufactured soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover with tarps to prevent windblown dust or temporarily seed as per Division 31 Section "Erosion and Sedimentation Controls".

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Contamination/intermixing of soil materials is just cause for rejection of material.

3.13 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation and drainage.
2. Surveying locations of underground utilities for record documents.
3. Inspecting, testing, and approving of underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris from excavation.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.14 PLACEMENT OF FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

D. Place and compact fill material in maximum 8" lifts. After placement, thoroughly knead all general fill with sheep's foot rollers to break down any remaining chunks of soil prior to vibratory compaction.

E. Do not deposit fill in areas of standing water. Any pockets of sediment and foreign material are to be removed before filling continues.

F. Compaction: Each lift shall be compacted. Maintain optimum and proper moisture content to achieve required compaction. Coordinate with Owner on testing schedule throughout earthwork operations.

G. Fill under lawn areas shall be compacted between 92% and 96% modified AASHTO laboratory density (ASTM D-1557, Method C).

H. Fill under structures, pavements, and site improvements within 5' of grade shall be compacted to minimum 95% OF MODIFIED AASHTO laboratory density (ASTM D-1557, Method C). Fill under pavement 5 or more feet below grade shall be compacted minimum 92% of modified AASHTO laboratory density (ASTM D-1557, Method C). Under bituminous pavements, compact processed aggregate materials to minimum 98% modified AASHTO laboratory density. All layers of structural fill shall be compacted to a minimum of 95% OF MODIFIED AASHTO laboratory density (ASTM D-1557, Method C).

I. Special Requirements

1. Remove all accumulated silts and organic material from temporary sedimentation, siltation, and detention basins prior to proceeding with earthwork.
2. Phase all earthwork operations in all key identified slopes so that each slope and bench/terrace is completed, including compaction and stabilization prior to proceeding with next higher slope/bench. Notify Architect, Engineer, and Geotechnical Consultant for inspection of each slope/bench as it is formed and stabilized. Do not proceed with additional embankment/earthwork operation until approved by Owner's Representative and Engineer.
3. Structural fill will be subject to excavation for underfloor utilities prior to the concreting of the floor slab on grade. The excavation, and the subsequent re-filling with structural fill, including compaction, is included in this Contract.

3.15 LOCATION OF STRUCTURAL FILL

A. Compacted Structural Fill shall occur beneath interior slabs on prepared subgrade as noted above and as indicated on the Structural Drawings unless otherwise noted.

1. Fill beneath the slabs on prepared subgrade shall be a minimum thickness of 12” and of the thickness necessary to bring the grade elevation up to 6” below the underside of the slab on ground from the excavation elevation determined above and indicated on the Contract Documents.

B. Structural fill shall occur adjacent to new footings as indicated above and as indicated on the Structural Drawings and noted below.

1. Outside of the foundation walls of the building, this fill shall occur above the footing bottom, a minimum of 3 feet horizontally beyond the edge of the footing, to a height of 8" below finished exterior grade.

2. Where structural fill occurs beneath exterior wall or column footings along the exterior wall it shall extend beyond the edge of footings a minimum horizontal distance equal to the depth of the fill below the footing plus three feet.

3. For footings lying wholly outside of the building, (isolated from the main structure), this fill shall occur above the footing bottom, a minimum of 3 feet horizontally beyond the edge of the footings all around, and to a height of 8" below finished exterior grade.

C. All new utility trenches excavated in existing soils shall be backfilled with structural fill and compacted according to specified requirements. The excavated material must be removed from the building footprint.

3.16 MOISTURE CONTROL (All Soils)

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

B. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

C. Remove and replace, or scarify and air-dry, all soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

1. Stockpile or spread and dry removed wet satisfactory soil material.

D. The Contractor is alerted that the nature of native materials at this site is such that they are sensitive to moisture. On-site materials are difficult to handle and compact and are easily disturbed when wet. The Contractor shall plan and conduct his excavation and filling operations considering the nature of the on-site materials.

3.17 FILL AND COMPACTION OF MATERIALS

A. Place materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment (minimum 10 tons static weight, 20 tons dynamic force) and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Otherwise, conform to requirements of paragraph 3.12.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compaction of Crushed Stone which is not suited for field density testing shall be accomplished with two to three passes of a vibratory compactor.

D. Compaction equipment shall not be of the nature as to cause unstable conditions in the underlying natural soil. Compacting equipment shall be approved for use by the inspector of the Owner's testing laboratory.

E. Placement of structural fill shall be in layers exceeding thicknesses as noted below before compaction. In addition to the stated degree of compaction, all fill and backfill shall receive at least the compactive effort given in the following table. Application of the minimum compactive effort does not relieve the Contractor from his requirement to achieve the specified degree of compaction.

Compaction Method	Maximum Loose Lift Thickness	Minimum No.Of Passes
Hand operated vibratory plate or light roller in confined areas	6"	4"
Hand operated Vibratory drum rollers wighing at least 1000# in confined areas	8"	4"
Light Vibratory Drum Roller min 3000# dynamic force per foot of drum width	12"	4"
Medium Vibratory Drum Roller min 5000# dynamic force per foot of drum width	12"	4"

F. Each layer shall be compacted to 95% of maximum dry density as determined by AASHTO Method T 180. Structural fill will be subject to excavation for underfloor utilities prior to the concreting of the floor slab on grade. The excavation, and the subsequent re-filling with structural fill, including compaction, is included in this Contract.

3.18 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Shape pavement base course with required cross sections and elevations.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
3. In all cases, maintain positive drainage.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.

3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10 foot straightedge.

D. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of acceptable soil materials and compact simultaneously with each subbase and base layer.

E. Grade final surface of porous fill below building slabs on grade smooth and even, free of voids, depressions or mounds and compact to required elevation. Final grades within tolerance of ½" (1/4" above and ¼" below required elevation), when tested with a 10 foot straight edge.

3.19 STONE SCREENINGS

A. Install stone screenings at mow strips, backstops, dugouts, shot put, discus areas, warning tracks, site walks and all other athletic areas detailed on the Drawings.

B. Mix salvaged and screened stone screenings from Site Clearing operations, with new stone screenings to achieve a homogeneous mixture.

C. Install stone screenings surface over prepared base, rake smooth and compact.

3.20 SAND JUMPING PITS

A. Install sand in jumping pits, over geotextile separation fabric. Rake smooth and compact to an even grade, flush with adjacent curbing.

B. Provide Owner with one half (1/2) cubic yard of additional sand for every jumping pit constructed. Deliver to location, on site, designated by Owner.

3.21 ATHLETIC FIELD CONSTRUCTION

A. Construct athletic fields where and as detailed, including installation of subsoil as transition between sand drainage layer and topsoil.

B. Limits of athletic field construction are defined as a minimum of 15' beyond any playing line.

3.22 DRAINAGE FABRIC

A. Install drainage fabric as shown on Structural, civil and landscape drawings and details. Fabric shall be placed all around the crushed stone that surrounds the foundation drains. The crushed stone surrounding the perforated drain pipe shall be completely wrapped in geotextile drainage fabric. The fabric shall be lapped at all ends, edges, and joints with adjacent sections of fabric. Care shall be exercised to avoid puncturing or tearing the fabric. Any fabric punctured or torn shall be patched with another piece of fabric extending at least two feet beyond the puncture or tear.

B. Fabric shall be installed vertically between the crushed stone and the structural fill as detailed on the structural drawings.

3.23 FOUNDATION DRAINS

A. Install pipe to elevations as indicated. Proper fittings shall be provided as required by the configuration. Perforated pipe sections must be installed such that the perforated holes in the pipes are positioned downward to allow water to enter the pipes.

B. Verify proper pitch and flow, if specified, prior to backfilling.

3.24 FIELD QUALITY CONTROL

A. Testing Agency: Allow the Owner's testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.

a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM C 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.

2. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but no fewer than two tests.

3. Field testing of structural fill will consist of grain size analysis of gravel fill, Modified Optimum Density (AASHTO T-180) and field density tests at the rate of one (1) per 200 cubic yards of fill or at the discretion of the inspector.

B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or allow to dry, or remove and replace soil to the depth required, re-compact and retest until required density is obtained. All retesting costs are the responsibility of the Contractor.

C. Testing Laboratory's presence does not include supervision or direction of the actual work by the Contractor, his employees, subcontractors or agents. Neither the presence of the Testing Laboratory, nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.

D. Testing equipment will be provided by and testing performed by the Testing Laboratory, except as otherwise provided by Contract. Upon request by Architect, the Contractor shall provide such

auxiliary personnel and services as needed to accomplish testing work and to repair damage caused thereby to permanent work.

3.25 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Architect; reshape and re-compact at optimum moisture content to the required density.

C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.26 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. Refer to Division 32 Section “Topsoil” for disposal of topsoil.

END OF SECTION 31 20 00

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SECTION 31 25 00 — EROSION AND SEDIMENTATION CONTROLS

PART 1 – GENERAL

1.00 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.01 DESCRIPTION

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

B. Control measures to prevent all erosion, siltation and sedimentation of wetlands, waterways, construction areas, adjacent areas and off-site areas.

C. Control measures shall be accomplished adjacent to or in the following work areas:

D. Soil stockpiles and on-site storage and staging areas.

E. Cut and fill slopes and other stripped and graded areas.

F. Constructed and existing swales and ditches.

G. Protection of drainage structure inlets.

H. At edge of wetlands areas, if applicable, as shown on Drawings.

I. Protection of stockpile areas.

J. Additional means of protection shall be provided by the Contractor as required for continued or unforeseen erosion problems, at no additional cost to the Owner

K. Periodic maintenance of all sediment control structures shall be provided to ensure intended purpose is accomplished. Sediment control measures shall be in working condition at the end of each day.

1.03 RELATED SECTIONS:

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary

B. Section 31 23 33 – Trenching and Backfilling.

1.02 REFERENCES

A. Wherever reference is made to the DOT Specifications, it shall mean the Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction Form 817 (2016) as modified by Supplemental Specifications issued by the Connecticut Department of Transportation.

1.03 QUALITY CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to a sediment and erosion control plan specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

B. Erosion control measures shall be established at the beginning of construction and maintained during the entire period of construction. On-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation, are to be identified and receive special attention.

C. All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time, and the length of time of exposure.

D. Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.

E. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving stream bed, provide measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream.

F. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedimentation damage.

G. The Contractor is responsible for cleaning out and disposing of all sediment once the storage capacity of the sediment facility is reduced by one-half.

H. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

I. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 2 – PRODUCTS

2.01 HAY BALES AND STAKES

A. Hay Bales: Forty pounds minimum weight and 120 pounds maximum weight.

B. Wood Stakes:

1. Two (2) per bale for securing bales.

2. Sizes: As shown on the Drawings.

2.02 MATERIALS FOR SILT FENCE

A. Filter Fabric; Filter Cloth:

1. Subarticle M.08.01-26, DOT Specifications.

2. Obtain manufacturer's certification that filter fabric conforms to the requirements of these Specifications.

3. Obtain the filter fabric from a manufacturer who produces the material for use in silt fences and who has a design for that use.

4. Do not use fabric susceptible to deterioration in sunlight.

5. Submit 2-foot square sample and technical data sheet for acceptance by the Owner.

6. Submit manufacturer's installation instructions for acceptance by the Owner.

B. Posts or Other Suitable Mounting:

1. Lengths of wood posts: As shown on the Drawings. Cross-section dimensions: As recommended by filter fabric manufacturer.

2. Other Suitable Mounting: As recommended by the manufacturer.

C. Provide materials as required by the manufacturer for attaching fabric to posts.

2.03 MATERIALS FOR ANTI-TRACKING PAD

A. Crushed Stone: Sound, tough and durable; free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. Grading: Article M.01.01, DOT Specifications No. 4.

B. Filter Cloth: Subarticle M.08.01-26, DOT Specifications.

2.04 EROSION-CONTROL BLANKETS

A. Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 – EXECUTION

3.01 PLACING HAY BALES

A. Place hay bales at slopes, at catch basins and at other locations as shown on the Drawings.

B. Embed hay bales to a depth of 6 inches.

C. Drive stakes through hay bales into ground to secure hay bales.

D. Place and stake hay bales at all locations as necessary to intercept and to filter overland stormwater flows before these flows enter streams or ponds.

E. Whenever pumping water from excavations, discharge the water such that it passes through hay bales before entering a storm drain or water body.

F. Remove accumulated sediment and replace bales when system becomes clogged or when directed by the Owner.

G. Remove hay bales at completion of project unless the Owner directs otherwise.

3.02 CONSTRUCTION AND MAINTENANCE OF SILT FENCES

A. Construct silt fences as shown on the Drawings.

B. Construct silt fences in accordance with manufacturer's instructions as accepted by the Owner.

C. Maintain or replace silt fences until they are no longer necessary or as ordered by the Owner.

D. Remove silt fences at completion of project unless the Owner directs otherwise.

3.03 CONSTRUCTION AND MAINTENANCE OF ANTI-TRACKING PAD

A. Construct anti-tracking pad at location shown on the Drawings.

B. Excavate to length, width and depth dimensions as shown on the Drawings.

C. Place filter cloth on excavated subgrade.

D. Place crushed stone on filter cloth to depth as shown on the Drawings.

E. Maintain the entrance in a condition that will prevent tracking or flowing of sediment onto the public right-of-way. When necessary, increase thickness by adding additional crushed stone; or increase length by excavating to subgrade and placing additional filter cloth and crushed stone; or do both in order to prevent tracking or flowing of sediment. Immediately remove all sediment spilled, dropped, washed or tracked onto the public right-of-way.

F. Remove anti-tracking pad at completion of project unless the Architect directs otherwise or at a time when permanent access can be constructed.

3.04 CONSTRUCTION OF EROSION CONTROL BLANKETS

A. Protect seeded areas with slopes exceeding 1V:3H or as indicated on the plans with erosion-control blankets installed and stapled according to manufacturer's written instructions.

3.05 VEGETATIVE STABILIZATION / TEMPORARY SEEDING

A. Grassing shall be applied according to State of Connecticut DOT form 817 Standard Specifications.

3.05 INLET PROTECTION

A. Install silt fence or straw bales around inlet as specified herein.

3.06 DUST CONTROL

A. Throughout the construction period the Contractor shall carry on an active program for the control of fugitive dust within all site construction zones, or areas disturbed as a result of construction. Control methods shall include the following: Apply calcium chloride at a uniform rate of one and one-half (1 ½) pounds per square yard in areas subject to blowing. For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.

B. The frequency and methods of application for fugitive dust control shall be as directed by the Engineer.

3.07 TEMPORARY PROTECTIVE COVERINGS (AFTER GROWING SEASON)

A. Place temporary covering for erosion and sedimentation control on all areas that have been graded and left exposed after October 30. Contractor shall have the choice to use either or both of the methods described herein.

B. Hay or straw shall be anchored in-place by one of the following methods and as approved by the Engineer: Mechanical “crimping” with a tractor drawn device specifically devised to cut mulch into top two inches of soil surface or application of non-petroleum based liquid tackifier, applied at a rate and in accordance with manufacturer’s instructions for specific mulch material utilized.

C. Placement of mesh or blanket matting and anchoring in place shall be in accordance with manufacturer’s printed instructions.

D. Inspect protective coverings periodically and reset or replace materials as required.

3.08 TEMPORARY SETTLING BASIN

A. Shall collect stormwater runoff by use of earthen berm or excavated settling pond. The settling basin shall provide at least 18 inches of depth for runoff to settle out suspended solids prior to discharge. Discharge shall be through a gravel and crushed stone filter and apron.

3.05 COMPLIANCE WITH GUIDELINES AND PERMITS

A. The Contractor shall review the CTDEEP guidelines (Connecticut Guidelines for Soil Erosion and Sediment Control), and the requirements of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities prior to any site disturbance.

B. Inspection shall be performed in accordance with the General Permit as directly cited below:

1. "Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction activity that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.1 inches or greater. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months."

2. "Disturbed areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Where discharge locations or points are assessable, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking."

3. "Based on the results of the inspection, the description of the potential sources and pollution prevention measures identified in the Plan shall be revised as appropriate as soon as practicable after such inspection. Such modification shall provide for timely implementation of any changes to the site within 24 hours and implementation of any changes to the Plan within three calendar days following the inspection. The plan shall be revised and the site controls updated in accordance with the General Permit."

C. Stormwater runoff shall be directed away from disturbed areas whenever possible by the use of temporary berms, swales hay bales or silt fence.

D. In areas where more than 2 acres will be disturbed, sediment traps or other controls will be constructed in accordance with the guidelines.

E. For discharge points that serve an area with more than 5 disturbed acres at one time, a sediment basin, designed in accordance with the guidelines, shall be installed and shall provide a minimum of 134 cubic yards of water storage per acre drained. The sediment basin shall be maintained until final stabilization of the contributing area. This requirement shall not apply to flows from off-site areas and flows from the site that are either undisturbed or have undergone final stabilization where such flows are diverted around the sediment basin. Outlet structures from sedimentation basins shall not encroach upon a wetland.

F. The Owner or its representative may require additional controls, as they are deemed necessary due to construction phasing, weather conditions, or other unforeseen conditions that cause excessive soil erosion or sedimentation.

END OF SECTION

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SECTION 32 12 16 — ASPHALT PAVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 DESCRIPTION

A. Work Included: Bituminous concrete drives, parking, and patching, complete in place, as shown on the Drawings and as specified herein including:

1. Saw cut existing pavement as required.
2. Maintenance and protection of pedestrian traffic as required.

B. Related Sections:

1. Section 01 23 00 - Alternates
2. Section 31 20 00 – Earth Moving;
3. Section 32 31 13– Chain link Fences and Gates

1.3 QUALITY ASSURANCE

A. Qualifications of Workmen

1. Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this Section, and who shall be present at all times during progress of the work of this Section and shall direct all work performed under this Section.

2. For actual finishing of bituminous concrete surfaces and operation of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required.

1.4 REFERENCES

A. Wherever reference is made to the DOT Specifications, it shall mean the Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 817 (2016) as modified by Supplemental Specifications issued by the Connecticut Department of Transportation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Subbase crusher-run stone conforming to the requirements of Article M.01.01, for No. 6 stone (3/8" crushed stone), DOT Specifications or to the following:

Sieve Size	Percent Passing
3.5"	100
¾"	50-100
No. 4	25-75

The fraction, passing the No.4 sieve shall have less than 15% passing the No. 200 sieve.

B. Base: Processed aggregate for the base shall conform to the requirements of Article M.05.01, DOT Specifications. Coarse Aggregate shall be broken stone conforming to the requirements of Article M.05.01-2 (b).

C. Pavement Materials:

1. Bituminous concrete mixtures conforming to the requirements of Section M.04 of the DOT Specifications.

2. In Section M.04, reference is made to the Chief, Materials Testing Section, to the Materials Testing Section, and to the Laboratory; none will be involved in this work. Do the work of the Chief, the Section, and the Laboratory; or arrange for the producer of the bituminous concrete to do this work. Make the determinations, verifications, rejections, approvals, tests, and inspections as specified by Section M.04 and as necessary to produce satisfactory bituminous mixtures.

D. Tack Coat: Section M.04 of the DOT Specifications.

E. Joint Sealer: A rubber compound of the hot-poured type conforming to the requirements of Article M.04.02 of the DOT Specifications.

F. For Running track and or Tennis Court asphalt see additional requirements refer to Section 32 Asphalt Paving – Running Track or Asphalt Paving Tennis Courts.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions under which work of this Section will be installed. Correct conditions detrimental to proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 FINAL PREPARATION OF SUBGRADE

A. After preparation of subgrade as specified in Section 31 20 00 – Earth Moving of these Specifications, thoroughly scarify and sprinkle the entire area to be paved, and then compact by rolling to a smooth, hard, even surface of 95 percent of modified optimum density to receive subbase. Finish to the required grades, with due allowance for the thickness of bituminous concrete courses to be placed thereon.

B. Equipment: Compact by rolling with a 15-Ton vibratory roller.

3.3 CONSTRUCTION OF SUBBASE AND BASE COURSE

A. After subgrade has been completed and accepted by the Architect, construct the subbase and base over all areas to be paved.

B. Construct subbase in accordance with the requirements of Article 2.12.03 of the DOT Specifications, however compact with four passes of a 15-Ton (static weight) roller.

C. Construct base in accordance with the applicable requirements of Article 3.04.03 of the DOT Specifications. Compact to at least 98 percent of modified optimum density.

3.4 CONSTRUCTION OF BITUMINOUS CONCRETE PAVEMENT

A. Construct pavement in courses as called for on the Drawings. Use a class of bituminous concrete for each course as indicated on the Drawings. Thickness of each course: As shown on the Drawings.

B. Construct the bituminous concrete pavement in accordance with Article 4.06.03 of the DOT Specifications, except as modified below:

1. Article 4.06.03-1 Samples: Samples will not be taken by Materials Testing Section. Arrange for the producing plant to take its own samples to ascertain that mixtures are proper. Provide certifications. The Contractor will have the ultimate responsibility.

2. Article 4.06.03-2 Mixing Plant Inspection:

   a. Inspections, verifications, determinations, and approvals at the mixing plants will not be made by the Chief, Materials Testing Section. The Contractor will be responsible for mixtures and shall take whatever steps are required to ensure production of satisfactory mixtures. He shall certify that mixtures do meet specifications.

   b. Weights of completed mixtures will not be required.

3. Article 4.06.03-3 Mixing Plant Inspection - Field Laboratory: Delete in its entirety.

4. Article 4.06.03-4: Delete "Assistant Manager of Materials Testing" and substitute "Contractor."

5. Article 4.06.03-5: Delete "Assistant Manager of Materials Testing" wherever it appears and substitute "Contractor."

C. Certifications: Furnish certified test reports, material certificates, and certificates of compliance in accordance with the requirements of Article 1.06.07 of the DOT Specifications.

3.5 PROTECTION

A. Protect from traffic during all operations.

3.6 FINISH TOLERANCES

A. Finish surfaces to the following tolerances.

1. Subbase and Base: Plus 0.00 feet to minus 0.10 feet from line and grade shown on the Drawings.

2. Bituminous Concrete Surface Course: Plus or minus 0.05 feet at any point from line and grade shown on the Drawings. No variations in surface more than 1/8 inch in a 10- foot plane.

END OF SECTION

SECTION 32 13 13 – CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes exterior cast-in-place concrete pavement and cast-in-place curbs for the following:

1. Concrete Curbing.
2. Reinforced Concrete Slabs.
3. Integral Concrete Curbs and Walkways.
4. Joint Treatments.
5. Pavement Markings.
6. Concrete Sealant

B. Related Sections include the following:
1. Division 31 Section "Earth Moving".
2. Division 32 Section "Asphalt Paving".
3. Division 32 Section "Post Tensioned Concrete Courts"

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

B. Form 816: "Standard Specifications for Roads, Bridges and Incidental Construction", State of Connecticut, Department of Transportation, Form 816, 2004 edition, with 2005 supplement.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials project conditions, weather, test results, or other circumstances warrant adjustments.

C. Batch slips certifying concrete mix, air content, slump, and time of loading.

D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials and aggregate.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures, including integral color admixture.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or adhesive.
8. Joint fillers and sealants.
9. Concrete salt guard.

F. Shop Drawings of all score and expansion joint layouts. All layouts shall include conformance to requirements of colored concrete patterns and project requirements.

G. Submit Sample and data on plastic slip dowel system.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

E. ACI Publications: comply with ACI 301, "Specification for Structural Concrete", unless modified by the requirements of the Contract Documents.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.

G. Mockups: Cast mockups of full-size (minimum 12' long) sections of each type of concrete pavement to demonstrate typical joints surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Obtain Architect's approval of mockups prior to pavement construction.

3. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavements. Demolish mockups after acceptance of work.
4. Approved mockups may not be part of the completed work.

H. Comply with requirements of Form 816, Article M.03.

I. Walks, parking spaces and loading zones constructed for use by persons with accessibility challenges shall conform to the applicable portions of the Americans With Disability Act Accessibility Guidelines (ADA) and the Connecticut State Building Code.

J. Detectable warning surfaces must be installed at the bottom of all curb ramps and flush curbs associated with accessible parking and passenger loading spaces, in accordance with the Americans with Disabilities Act Accessibility Guidelines. The bottom 24 inches of any curb ramp or flush curb adjacent to handicapped parking or loading areas shall contain a truncated-dome tactile surface, of contrasting color to the walk surface, 6 inches back from the curb line, for the full width of the ramp surface or flush curb.

K. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Meetings”.

1. Before submitting design mixes, review concrete pavement mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with concrete pavement to attend, including the following:

a. Contractor’s superintendent.
b. Independent testing agency responsible for concrete design mixes.
c. Ready mix concrete producer.
d. Concrete subcontractor.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities. Provide temporary barricades and warning lights as required.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves of a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Conform to all State and local requirements for levels of toxicity.

2.2 STEEL REINFORCEMENT

A. Uncoated Welded Wire Fabric: ASTM A-82/A-185; AASHTO M32, Class A, plain steel. Flat sheets required

B. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed

C. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

D. Joint Dowel Bars: Galvanized smooth steel dowels, ASTM A 615/A 615M, Grade 60. Cut dowels true to length with ends square and free of burrs. Provide polypropylene plastic slip dowel sleeves system. System shall be similar to "speed dowel" by Aztec Concrete Accessories, or approved equal.

E. Tie Bars: ASTM A 615/A, Grade 60, deformed.

F. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. General: Use the same brand and type of cementitious material form the same manufacturer throughout the Project. Batch mixing at site not acceptable.

B. Compressive Strength: Minimum 4,000 psi at 28 days.

A. Compressive Strength for Concrete Vehicle aprons: Minimum 5,000 psi at 28 days.

B. Portland Cement: ASTM C 150, Type I or II.

C. Portland Cement for Concrete Vehicle aprons: ASTM C 150, Type V.

D. Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse aggregate as per Form 816, Article M.03.01, Class "F".

1. Do not use fine or coarse aggregates containing substances that cause spalling.

E. Water: ASTM C 94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.

B. Air-Entraining Admixture: ASTM C 260, 5-6%.

C. Air-Entraining Admixture for Concrete Vehicle aprons: ASTM C 260, 7-8%.

D. Water-Reducing Admixture: ASTM C 494, Type A.

E. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

F. Water Reducing and Accelerating Admixture: ASTM C 494, Type E.

G. Water Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: Wet curing utilizing white polyethylene film or white burlap polyethylene sheet, ASTM C171; or resin-based, clear emulsion liquid dissipating cure which will not discolor the concrete, conforming to ASTM C309 Type I of ID, Class A & B and AASHTO M-148.

C. Water: Potable

D. Curing compounds may be utilized by the contractor at their option. The curing compound shall be suitable and compatible with the specified salt guard. The Contractor shall submit a letter from the compound manufacturer verifying the compatibility in this specific application. Contractor shall describe and outline the procedures and process for preparing the concrete to receive salt guard. Owner and Architect will review submittal in consideration of acceptance. Contractor shall provide other projects where this product has been used for review.

2.6 RELATED MATERIALS

A. Expansion and Isolation Joint Filler Strips: ASTM D 1751, asphalt saturated, cellular fibers, as manufactured by Sealtight, W.R. Meadows, or approved equal.

1. Thickness – one-half inch.
2. Depth – to match full section of concrete pavement/curb.

B. Removable Vinyl Joint Cap Strips: Compatible with filler strips width, as manufactured by Vinylex Corp. or approved equal. Provide in lengths equal to lengths of filler strips.

C. Joint Sealer: Compatible with filler strips, two component polyurethane elastomeric type complying with FS-TT-S-00227, self leveling designed for pedestrian and vehicular traffic, as manufactured by Sika, Percora, or approved equal. Include primer and backing rods as required.

1. Type: Class II, non-load bearing, for bonding freshly mixed to hardened concrete.
2. Type: Class I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
3. Type: Class IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Detectable warning surfaces shall be vitrified polymer composite, cast-in-place replaceable tiles fabricated from an epoxy polymer composition with an ultraviolet stabilized coating employing aluminum oxide particles in the truncated domes. Color shall be selected from manufacturers full selection of colors. Tiles shall be similar to "Armor-Tile" as manufactured by Engineered Plastics or approved equal. Units shall be removeable/ replaceable type and anchored with manufacturers stainless hardware.

2.7 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal weight concrete determined by either laboratory trial mixes or field experience.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.

1. Do not use Owner's field quality-control testing agency as the independent testing agency.

C. Proportion mixes to provide concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 3 inches.
4. Sacks of Cement (minimum): 7 sacks per cubic yard.

D. Proportion mixes for concrete for vehicular traffic areas including but not limited to vehicle aprons and continuous walkways adjacent to the building at overhead doors, vehicle aprons/crossings at site sidewalks (sallyport access) and dumpster pad. Provide concrete with the following properties:

1. Compressive Strength (28 Days): 5000 psi.
2. Maximum Water-Cementitious Materials Ratio: 0.40.
3. Slump Limit: 3 inches.
4. Sacks of Cement (minimum): 7 sacks per cubic yard.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94, and Form 816.

2.9 AUXILLARY MATERIALS

A. Pavement Markings:

1. Parking lines, stop bars, and aisles: Fast curing epoxy white Traffic Paint, per Form 816, Section M.07.20.

2. Handicapped symbols and striping: Fast curing epoxy blue Traffic Paint, per Form 816, Section M.07.20.

3. Crosswalks: retroreflective thermoplastic performed material, 90 mils thick, consisting of a homogeneous mixture of high quality polymeric thermoplastic binders, pigments, fillers and glass beads. Materials shall conform to AASHTO, M249-79 (86) except for material being preformed. Color shall be white.

B. Driveway center lines (two-way traffic): Fast curing white traffic paint, as per Form 816, Section M.07.20.

C. Fire Lanes: Fast curing yellow traffic paint, as per Form 816, Section M.07.20.

D. Contractor shall provide a line striping shop drawing for review and approval, including proposed colors. Final colors and markings shall be reviewed by the Owner and Town of Windsor for final approval. Colors shall be adjusted at no additional expense to the contract.

PART 3 - EXECUTION

3.1 PREPARATION

A. Proof-roll prepared surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and sub grade is ready to receive pavement. Do not install concrete over saturated, muddy or frozen base.

B. Remove loose material from compacted base surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement and curbs to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement. At points where change of grades is more than 2% introduce approved vertical curve. No abrupt changes in grade will be accepted.

B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

C. Curb forms to be true to horizontal and vertical alignment. Forms to be true to radiuses specified.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lap splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.4 JOINTS

A. General: Construct construction, expansion, score joints, and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Expansion Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated. Approval required prior to pour.

1. Locate expansion joints at intervals of 20 feet maximum, unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. If joint sealant is indicated, install removable vinyl cap strips and set top of cap strip flush with finished concrete surface.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal cap after concrete has been place on both side of joint.
7. Install dowel bars and support assemblies at joints where and as indicated.

C. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
3. Provide tie bars at sides of pavement strips where indicated.

4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. Use epoxy bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

D. Score Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks (tool wings) on concrete surfaces. Maximum spacing 6’0” in any direction. Areas of concrete sidewalk replacement shall be patterned to match existing pavement. Joints shall be straight or true to radius shown – poor workmanship is just cause for rejection of pavement.

   a. Radius: ¼ inch.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

1. Radius: ¼ inch.

F. Rub all exposed vertical faces of curbs to eliminate blemishes, pockmarks, honeycombing, and all other defects. Plastering is not permitted.

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work. Protect adjacent work from damage, splatter, and all other concrete operations.

B. Remove snow, ice, or frost from sub base surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten sub base to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.

D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery, at Project site, or during placement, unless approved by Engineer.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.

I. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.

J. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

K. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and sub grade just before placing concrete. Keep sub grade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power driven floats, or by hand floating if area is small or inaccessible to poser units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture (standard). Provide cleanly finished fine textured broom finish on all colored concrete pavements including variating directions of the brooming.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic (handicap access ramps).

C. Detectable Warning Surface Tile: Complete installation of concrete ramp and surface finish in accordance with these specifications.

1. The factory-installed plastic sheeting must remain in place during the entire installation process, to prevent the splashing of concrete onto the finished surface of the tile.
2. When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes around the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each vane on the underside of the tile. This will lock the tile solidly into the cured concrete.
3. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, an electronic level should be used to check that the required slope is achieved. The tile shall be placed true and square to the curb edge in accordance with the contract drawings. The Cast-In-Place Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
4. Immediately after tile placement, the tile elevation is to be checked to adjacent concrete. The tile elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates.
5. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to float the concrete around the tile's perimeter, flush to the field level of tile.
6. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.
7. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.

8. Following the curing of the concrete, protective plastic wrap is to be removed from the tile face by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft wire brush will clean the residue without damage to the tile surface.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with Form 816, Section 4.01.03**,** and ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturers written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof.

3.8 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: ¼ inch.
2. Thickness: Plus 3/8 inch, minus ¼ inch.
3. Surface: Gap below 10-foot long, unleveled straightedge not to exceed ¼ inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
5. Vertical Alignment of Tie Bars and Dowels: ¼ inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel ¼ inch per 12 inches.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel ¼ inch per 12 inches.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus ¼ inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

B. Typical cross slope of pavement is 2.0% unless otherwise indicated. In no case will water be allowed to stand or puddle on any finished pavement.

3.9 JOINT AND CONCRETE SEALANT INSTALLATION

A. Apply a deep penetrating water and salt barrier such as Consolideck Saltguard WB as manufactured by Prosoco Inc. Clean all concrete prior to application as per manufacturer's recommendations. Do not dilute material. Apply evenly with sprayer or roller in a single saturating coat per mfr. Application shall be enough to keep surface wet for 2-3 minutes before penetrating. Do not over apply. Coverage rates may vary based on porosity and texture.

B. Install joint sealants in all expansion joints in accordance with the manufacturer's installation instructions. Clean and prime joints. Remove dirt and loose coatings.

C. Apply sealant in continuous beads, without open joints, voids, or air pockets. Hand tool and finish all joints. Physical samples of sealants shall be submitted for color selection in field.

D. Confine materials to joint areas with masking tape or other precautions. Insure joint sealing is cleanly executed with no override onto adjacent pavement.

E. Remove excess compound promptly as work progresses and clean adjoining surfaces. Protect until full cured.

F. In rough surfaces of joints of uneven widths, hold joint sealant well back into joints.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

B. Testing Services: Testing shall be performed according to the following requirements:

1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C172, except modified for slump to comply with ASTM C 94.
2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not les than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. Yd., but less than 25 cu. Yd., plus one set for each additional 50 cu. yd. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required
7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
8. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive compressive-strength testing if adequate evidence of satisfactory strength is provided.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
10. Strength level of concrete will be considered satisfactory if average of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi.

C. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28 day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as the sole basis for approval or rejection.

E. Additional Tests: Testing agency shall make additional tests for the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.

B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

3.12 PAVEMENT MARKINGS

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

END OF SECTION 32 13 13

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SECTION 32 13 25 – POST-TENSIONED CONCRETE COURTs

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. Section includes:

1. Installation of post-tensioned concrete basketball 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.

D. Related Sections include the following:

1. Division 3 Section "Concrete"
2. Section 31 20 00 "Earth Moving"
3. Division 32 Section "Concrete Paving"
4. Section 32 86 00 "Athletic Equipment"

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. 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 and Incidental Construction, Form 817, 2004 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. American Society for Testing and Materials (ASTM)

1. ASTM A416 - Standard Specification for Steel Strand, Uncoated Seven-Wire for Pre-stressed 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.

1.4 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 basketball 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 basketball court 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 C 94.

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.

1.5 QUALITY ASSURANCE

A. Post-tensioned concrete court installer shall be the same as the court coating installer. Subcontractors for the installation of court surfacing is not permitted.

B. 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.

C. 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 courts completed within the past five (5) 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 basketball courts completed within the past five (5) years. Reference projects shall be at least equal to the square-footage of the proposed project.

   b. Onsite supervisions and stressing operations shall be provided by personnel certified under either the "Level 2" Unbonded PT – Field Installation or the Slab-On-Ground Installer/Stressor programs under the PTI "Training and Certification of Field Personnel for Unbonded Post-Tensioning". The oversight and certification of the stressing operations may be overseen by a certified third party.

   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.

D. 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.

E. Layout Review: Stake and lay-out post-tensioned court for review by Engineer prior to excavation, setting forms, etc.

F. 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.

G. 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 E 329.

1.6 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.

1.7 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.

1.8 PROJECT/SITE CONDITIONS

A. Comply with Section 03 3200 - Site Cast-in-Place Concrete.

1.9 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 (15) 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 8-1/2-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 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 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.

3. Slump: no less than 4 inches, not greater than 7 inches, ASTM C143 unless otherwise approved by Engineer.

4. 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 1/2 inches. 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 C 171, regular or white.

B. Polyethylene sheeting, ASTM C 171.

C. Membrane forming spray-on chemical compounds are not permitted.

2.5 FLOWABLE CONCRETE FILL/BACKFILL (FLOWFILL)

A. Cementitious material, ACI 229R, comprised of cement, aggregates, water, and admixtures, capable of being poured or pumped, self-leveling, self curing to specified strengths. Minimum 28 day compressive strength of 100 psi.

2.6 GRANULAR FILL

A. Comply with Section 31 2310 - Earthwork.

2.7 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.

2.8 POLYETHYLENE SHEETING

A. Vapor Barrier/Bond Breaker: 10 mil, ASTM D4397.

2.9 WATERPROOFING COMPOUND

A. Solvent-based asphaltic waterproofing compound.

2.10 GROUT

A. Non-shrink, non-metallic grout, bagged, pre-mixed formulations, ASTM C 1107, or site mixed, ASTM C 476.

2.11 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 5/8" 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.

2.12 REINFORCEMENT MATERIALS

2.13 Reinforcing Bars: ASTM A615, Grade 60 deformed bars.

2.14 TENDONS

A. Steel, low relaxation strand, seven-wire cable, nominal 1/2" 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.

2.15 TENDON SUPPORTS/CHAIRS

A. Intersectional chairs as manufactured by General Technologies, Inc. (Stafford, TX) or approved equal. Sized for 1/2-inch cable tendon and 5 inch slab thickness.

2.16 ISOLATION JOINT FILLER.

A. Synthetic foam joint material, ASTM D 1752, 1-inch thick.

2.17 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. Leveling:

1. 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.

2. Remove heaves or high spots flush with the existing court surface by grinding or other approved method.

C. 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.

D. 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 1/2" 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 subgrade, 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 basketball 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. 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 32 13 16

SECTION 32 1823.53 - COURT SURFACING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. Section includes:

1. Post-Tensioned Concrete Court Pavement Preparation.
2. Court Surfacing.
3. Tack coat and Patch Binder.
4. Acrylic Resurfacer.
5. Acrylic Filler & Finish Coat.
6. White line painting to courts and designate playing areas.

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. Related Sections include the following:

1. Section 31 20 00 "Earth Moving"
2. Section 32 13 16 "Post-Tensioned Concrete Courts"
3. Section 32 86 00 "Athletic Equipment"

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. Code of Federal Regulations (CFR).

1. 29 CFR 1926, Safety and Health Regulations for Construction.

C. American Concrete Institute (ACI).

D. United States Tennis Association (USTA).

E. International Tennis Federation (ITF).

F. American Sports Builders Association (ASBA).

G. State of Connecticut.

1. Form 817: "Standard Specifications for Roads, Bridges, and Incidental Construction", State of Connecticut, Department of Transportation, Form 817, 2016 edition, as supplemented.

H. American Society for Testing and Materials (ASTM)

1.4 DEFINITIONS

A. Specifications for components, color chart and installation instructions.

1.5 SUBMITTALS

A. Manufacturer specifications for components, color chart and installation instructions.

B. Authorized Applicator certificate from the surface system manufacturer.

C. ITF classification certificate for the system to be installed.

D. Reference list from the installer of at least ten (10) successful post-tensioned concrete court projects completed in the past five (5) years utilizing the same surfacing materials. On-site superintend shall be the same as proposed for this project on all 10 projects and shall have constructed the post-tensioned concrete base and installed the court surfacing.

1. The installation contractor must be able to supply, upon request, a list of ten (10) projects constructed and surfaced with the specified materials, by the proposed on-site superintendent over the last five (5) years with the Owners contact information.

2. The ten (10) projects shall not have required maintenance to the court coatings over the 5-year period. 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.

E. Current Material Safety Data Sheets (MSDS).

F. Review, testing, and Certificate of Acceptance of the concrete court base prior to installation of the surface.

1. Any application of surfacing material without submission of Certificate of Acceptance shall designate the approval of the post-tensioned concrete base. Any rework and testing shall be done at no cost to the Owner.

G. The contractor shall provide the Landscape Architect an estimate of the volume of each product to be used on the site based on the approved manufacturers recommendations.

H. The contractor shall record the batch number of each product used on the site and maintain it through the warranty period. Record shall be submitted for documentation by the Landscape Architect.

I. Warranty documentation as described here in Section 1.8 Warranty.

J. Owner’s Manual for required maintenance on the court surfacing, netting system, wind screen, practice board, and fencing.

1.6 COORDINATION

A. Contractor shall coordinate with all other trades, especially Site Contractors to ensure approval of surrounding work prior to being post-tensioned concrete base construction and surfacing application. Any rework shall be done at no cost to the Owner.

1.7 QUALITY ASSURANCE

A. Surfacing installation superintend is to be on-site at all times while work is commencing.

B. Surfacing shall conform to the guidelines of the ASBA for planarity, or the design plans, whichever is more stringent shall govern.

C. Concrete shall have a vapor barrier in accordance with ASTM E-1745.

D. Concrete mixes should be placed with a water/cement ratio of .45.

E. Curing compounds should not be used unless the curing compound manufacturer specifically states the surface may be coated with water based acrylic coatings.

F. The contractor shall record the batch number of each product used on the site and maintain it through the warranty period.

G. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.

H. The installer shall be an authorized applicator of the specified system.

I. The 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.

1.8 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.

C. All surfacing materials shall be non-flammable.

1.9 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 warranty:

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.

5. Warranty shall cover cracking, spalling, bubbling, premature fading, flaking, and other failures of the coating material.

1.10 INSTALLER QUALIFICATIONS

A. Installer shall be regularly engaged in construction and surfacing of post-tensioned concrete based, acrylic coated courts.

B. Installer shall be an Authorized Applicator of the specified surface system.

C. Installer shall have successfully completed ten (10) projects of similar scope done in the past five (5) years using the same materials (post-tensioned concrete base and acrylic coatings). On-site superintend shall be the same as proposed for this project on all ten (10) projects.

1. Projects shall have required no maintenance or surfacing issues.

1.11 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 / Plexipave Fortified System www.plexipave.com

B. World Class Courts, Richmond, VA. www.worldclasscourts.com

C. NOVACRYLIC, Nova Sports, Framingham, MA / Combine Surface www.novasports.com

2.2 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 Architect and Owner's 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 2. Under no circumstance may the final color surface contain silica sand added at the job site. Under no circumstances will systems from multiple manufacturers be considered.

2.3 MATERIALS

A. Court Patch Binder/ Patching Mix - for use in patching cracks, holes, depressions and other surface imperfections.

B. Crack Filler - for use in filling fine cracks.

C. Concrete Preparer is a specially formulated acid heat for use in neutralizing the concrete in preparation for the Acrylic Surfacing System.

D. Adhesion Primer – is a two-component water-based epoxy primer for uncoated concrete surfaces.

E. Acrylic Filler Course – for use as a filler for new or existing concrete surfaces. The 100% acrylic filler shall be blended with approved silica sand at the job site.

F. Acrylic Color Playing Surface– for use as the finish color and texture. A two-part system blended to achieve the correct surface texture.

G. Line Paint – for use as the line marking on the court/play surface.

H. Water – for use in dilution/mixing shall be clean and potable.

2.4 COLORS

A. Final Court Colors: (All colors from manufacturer's standard pallette)

1. Court Field (non-court areas): Dark green.
2. Court Areas: light green courts
3. Lines: White

2.5 MATERIAL SPECIFICATIONS

A. Court Patch Binder – 100% acrylic resin blended with Portland Cement and silica sand.

1. Percent solids by weight (minimum) 46%

2. Weight 8.7-8.9 lbs./gallon

B. Crack Filler – 100% acrylic resin heavily filled with sand.

1. Percent solids by weight (minimum) 46%

2. Weight 15 lbs./gallon

C. Concrete Preparer – Phosphoric Acid based surface treatment

1. Percent solids by weight (minimum) 25.5%

2. Weight 9.5-9.6 lbs./gallon

D. Two-Component Epoxy Primer

1. Percent solids by weight (minimum) 34.6-34.8%

2. Weight 8.55-8.70 lbs./gallon

E. Acrylic Resurfacer – 100% acrylic resin (no vinyl copolymerization constituent). The product shall contain not less than 3.5% attapulgite.

1. Percent solids by weight (minimum) 26.7%

2. Weight 8.7-8.9 lbs./gallon

F. 100% Acrylic Resin (no vinyl copolymerization constituent) with selected light fast pigments. Green shall contain not less than 8% chrome oxide.

1. Percent solids by weight (minimum) 36.5%

2. Weight 10.0-10.2 lbs./gallon

G. Color Base – 100% acrylic resin containing no vinyl copolymerization constituent. Contains not more than 63% rounded silica sand.

1. Percent solids by weight (minimum) 74%

2. Weight 13.1-14.1 lbs./gallon

H. Line Paint – 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.

1. Percent solids by weight (minimum) 60.5%

2. Weight 12-12.3 lbs./gallon

I. All surfacing materials shall be non-flammable and have a VOC content of not less than 100g./ltr. Measured by EPA method 24.

J. Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to insure quality and stability.

K. Asphalt or tar in any form will not be permitted in any coating.

L. The color shall be pure acrylic containing no asphalt or tar emulsions and no vinyls, alkyds or non-acrylic resins. The color system shall contain factory mixed compounds requiring only the addition of water at the job site.

M. All material shall be delivered to the site in sealed containers with manufacturers label affixed.

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 28 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. 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 Clorox or approved product to kill the organisms and then be properly rinsed. The entire surface shall receive a thorough washing using muriatic acid.

1. The acid shall be a 20% base solution before adding water.

2. The dilution factor of the muriatic acid shall be 50% water to a 20% solution acid.

3. The acid shall be applied and let stand for 4 hours before washing.

4. The surface shall be thoroughly washed using clean water to remove the residue.

B. Holes and cracks: 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 use of Court Patch Binder according to manufacturer's specifications.

C. Depression: Depressions holding enough water to cover a five-cent piece shall be filled with Court Patch Binder Patching Mix. 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.

1. Landscape Architect shall be notified at least 48 hours prior to this work being completed.

2. NO WORK FROM THIS STAGE ON SHALL COMMENCE UNTIL A CERTIFICATION OF ACCEPTANCE HAS BEEN SUBMITTED BY THE INSTALLATION CONTRACTOR TO THE LANDSCAPE ARCHITECT. Any work complete by the installation contractor prior to submission of certificate of acceptance shall mean the installation contractor has approved the post-tensioned concrete base as satisfactory.

D. Acid Treatment: 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.

E. The surface to be coated as specified 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.

F. 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.

G. Primer shall be applied to all uncoated concrete surface prior to application of filler materials. Apply at an application rate of .025-.03 gallon per square yard.

1. Mix component A with Component B at a ratio of 1:1. Let stand for 20-30 minutes prior to use.

2. Apply with a short nap phenolic core roller.

3. Allow the two-part 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.

H. Filler Course. (Acrylic Resurfacer): 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 on existing courts, 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 asphalt 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 may exceed the quantity specified by the manufacturer only by a small amount and only if too rapid drying is occurring because of weather conditions. Permission of the Owner 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 thoroughly. 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

A. All areas to be color coated shall be clean, free from sand, clay, grease, dust, salt or other foreign matters. The Contractor shall obtain the Engineer's approval, prior to applying any surface treatment.

B. Blend color base and acrylic resin with a mechanical mixer to achieve a uniform mixture. The mix shall be:

1. Color Base: 30 Gallons
2. 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 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.

1. The color system shall be applied in a two-color combination with the playing area being navy blue and the out of bounds area being gray or as instructed at the time of contract.

3.5 LINE PAINTING

A. Upon completion and acceptance of the tennis court surface, the Contractor shall prepare and paint lines for tennis.

B. Line shall be 2” wide unless otherwise noted on the drawings. Lines hall be carefully laid out in accordance with ASBA guidelines. The area to be marked shall be taped on both sides to insure a crisp line. All areas that have overlapped color shall be corrected.

1. Color: White

C. The 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 sg./gal. (3/4 gal. per court).

D. Each measurement shall be accurately set to within 1/8" tolerance in accordance with the United States Tennis Association specification.

E. Court shall be marked as indicated on the drawings.

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 leave the site in a clean and orderly condition, acceptable to the Owner and Construction Manager, at the completion of each work day.

B. Contractor shall remove all debris, residuals, and materials at the conclusion of the work.

END OF SECTION

SECTION 32 31 13 – 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. American Society for Testing and Materials (ASTM).

1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

2. ASTM A90- Standard Test Method for Weight (Mass) of Coating on Iron or Steel Articles with Zinc or Zinc Alloy.

3. ASTM A123- Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

4. ASTM A153- Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.

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.

D. Chain Link Fence Manufacturer's Institute

1. Chain Link Fence Manufacturer's Institute Product Manual, latest revision.

1.3 SYSTEM DESCRIPTION

A. Temporary Construction Fence shall meet the following basic parameters:

1. Fence Height: 8 feet.

2. Mesh Size: 2 inches.

3. Mesh Gage: 12

4. Gates: Height of gates shall match that of fence. Width of gates shall be as shown on the Drawings.

5. Anchored post or driven posts where indicated. No top or bottom rails required.

6. Panelized/modular units where indicated. Two stabilizers per panel.

B. Permanent Fence shall meet the following basic parameters:

1. Fence Height: Varies, refer to the Drawings.

2. Type:

a. At Tennis Courts: 9 gauge vinyl coated black mesh and accessories. 8' maximum pole to pole spacing.

3. Mesh Size:

a. Court fencing: 2"

b. All mesh to have knuckled both selvages.

4. Mesh Gage:

a. Fencing: Wire with a diameter of 9 gauge galvanized core fused. Measured prior to application of coating.

5. Gates: Height of gates shall match that of fence. Type and size of gates shall be as shown on the Drawings.

6. Anchored post where indicated; 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, reinforcements, and attachments.

3. Accessories: Privacy slats.

4. Gates, locking mechanisms and hardware.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.

D. Samples for Initial Selection: For components with factory-applied color finishes.

E. Samples for Verification: Prepared on Samples of size indicated below:

1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.

F. 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.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified factory-authorized service representative.

B. Product Certificates: For each type of chain-link fence, and gate, from manufacturer.

C. Product Test Reports: For framing strength according to ASTM F 1043.

D. Field quality-control reports.

E. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:

1. Polymer finishes.

2. Gate hardware.

1.7 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.

E. Testing Agency Qualifications: For testing fence grounding. Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for gates with automatic gate operators serving as a required means of access.

H. Mockups: Build mockups to set quality standards for fabrication and installation.

1. Include 10-foot length of fence and gate.

I. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

2. Review sequence of operation for each type of gate operator.

3. Review coordination of interlocked equipment specified in this Section and elsewhere.

4. Review required testing, inspecting, and certifying procedures.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 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.

1.10 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 accessories and mechanisms.

b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

B. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 GENERAL

A. Material furnished shall be in good condition and shall not have been painted.

B. All posts and rails shall be straight, true to section and of sufficient length for proper installation.

C. 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 LINE POSTS

A. See Drawings for size and type depending on height of fence.

1. Vinyl Coated Color: Black Class 2b fused and adhered

2. Galvanized class 2 – Zinc coating 2oz/ft^2

2.3 CORNER, END, AND PULL POSTS

A. See Drawings for size depending on height of fence.

1. Vinyl Coated Color: Black Class 2b fused and adhered

2. Galvanized class 2 – Zinc coating 2oz/ft^2

2.4 BRACE ASSEMBLY

A. Rails

1. 1.25-inch nominal (1.660 O.D.) steel pipe, steel pipe.

a. Vinyl Coated Color: Black Class 2b fused and adhered

b. Galvanized class 2 – Zinc coating 2oz/ft^2

B. Truss rod shall be 3/8-inch with adjustable turnbuckles or truss tightener to match fabric type.

2.5 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. Steel Wire Fabric:

a. Field Fencing: Wire with a diameter of 9 gauge galvanized core fused. Measured prior to application of coating.

b. Mesh Size:

1) 2 inches. Measured prior to application of coating.

c. Polymer-Coated Fabric: ASTM F 668, Class 2b.

1) Color: Black, ASTM F 934.

d. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

e. Galvinzed Fabric: ASTM F 392, Zinc coating 2oz/ft^2.

1) Color: natural grey.

2) Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

3. Selvage: Knuckled at both selvages.

2.6 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: As indicated on Drawings.

2. Light Industrial Strength: Material Group IC-L, round steel pipe, electric-resistance-welded pipe.

a. Line Post: Refer to Drawings for prost sizes based on fence height.

b. End, Corner and Pull Post: Refer to Drawings for prost sizes based on fence height.

3. Horizontal Framework Members: Intermediate top and bottom rails complying with ASTM F 1043.

a. Top, Bottom and Mid Rail for all fencing systems and all heights: Refer to Drawings for prost sizes based on fence height.

b. Brace Rails: Comply with ASTM F 1043.

B. Polymer coating over metallic coating.

1. Color: Black, ASTM F 934.

2.7 STRETCHER BARS

A. Bars shall be one piece lengths of zinc-coated steel, not less than 2-inches shorter than the full height of the fencing fabric with a minimum cross section of 3/16-inch by 3/4-inch, ASTM F626.

B. Polymer coating over metallic coating.

C. Color: Black, ASTM F 934.

2.8 TENSION WIRE

A. Polymer-Coated Steel Wire: Marcelled (spiraled or crimped) No. 7 gage, (0.177-inches) diameter, ASTM A824, ASTM F 1664,

B. Polymer coating Class 2b over-coated steel wire. Color Black, ASTM F 934.

C. Galvanized Type II zinc coated class 5 - 2oz/ft^2

2.9 HARDWARE AND TIES

A. Hardware & tie finish shall match that of fence fabric used.

B. 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 or aluminum alloy, ASTM F626.

C. Tension bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.078-inches and a minimum width of 3/4-inch.

D. 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 3/4-inch.

E. Wire ties shall be minimum 16-gage galvanized steel wire or minimum 9-gage aluminum alloy wire.

F. All fasteners shall be hot-dip galvanized, ASTM F2329.

G. Bolts: Steel, ASTM A307.

H. Washers: Steel, round, ASTM F844.

I. Bolts: Steel, ASTM A563 Grade A, hex head.

2.10 FITTINGS

A. General: Comply with ASTM F 626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.

2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

    a. Hot-Dip Galvanized Steel: 0.148-inch- (3.76-mm-) diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.

    a. Polymer coating over metallic coating.

2.11 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:

1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.

C. Posts: Round tubular steel.

1. Size: Refer to Drawings for prost sizes based on fence height.

D. Gate Frames and Bracing: Round tubular steel.

1. Framing:

    a. Size: Refer to Drawings for prost sizes based on fence height.

    b. Assemble gate frames by welded connections. 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. Hinges: 180-degree outward swing only.

    a. Hinge brackets shall be tak welded after install and coated.

    b. Gates hinges shall not allow swing over Court surfacing.

    c. Open gate position shall lie parallel to adjacent fenceline

2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.

3. All gates shall be equipped with hot-dipped galvanized steel hinges and latch with provisions for padlocking.

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, **one each leaf**.

5. Hinges shall be cast steel hinges capable of 180 degree opening. Tak weld hinge brackets to the steel post after installation to lock each hinge to the gate post and prevent rotation. No-lift-off type. Box type hinges are not acceptable.

6. Gate Leaves: Configured with intermediate members and diagonal truss rods or tubular members as necessary to provide rigid construction, free from sag or twist.

7. Latches, hinges, stops, keepers and other hardware items shall be furnished as required for proper operation.

2.12 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.

2.13 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. 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 F 567 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. Space posts a maximum of 8’ apart at Courts.

3. 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.

4. Gate post/footings shall be installed a minimum of 42-inches below grade.

5. 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. Provide a minimum of 2” of compressible expansion material around all posts within post-tensioned slab. Fill with surfacing compatible self leveling sealant.

d. Braces and truss rods shall be securely fastened to posts with appropriate hardware.

e. 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.

6. 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 3/4 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 F 567 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 Maximum.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, 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. 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 court side of posts, 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 each leaf at center of double gate openings.

E. **All gates shall open outward only. Gates shall not be able to swing over adjacent Court surfacing**. Gates shall open 180 degrees, fully so that gate leaf lies parallel to adjacent fence.

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 86 00 — ATHLETIC EQUIPMENT - TENNIS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes the following:

1. Tennis Nets and Posts
2. Wind Screens

B. Related Sections include the following:

1. Division 01 Section "Alternates".
2. Division 03 Section "Cast-In-Place Concrete".
3. Division 32 Section "Concrete Paving".
4. Division 32 Section "Turf and Grasses".

1.3 DEFINITIONS

A. "NFHS" refers to the current rules and regulations of the National Federation of State High School Associations.

1.4 UBMITTALS

A. Shop Drawings: Contractor shall provide fully dimensioned manufacturer's shop drawings, detailing specified product and confirming anchoring system, including relocated scoreboards. Scoreboard support shop drawings must be prepared by a Registered Professional Structural Engineer, licensed to practice in the State in which the project is being constructed. The Contractor shall retain and pay all costs associated with the Structural Engineer.

B. Manufacturer shall certify that all equipment meets current NHFSA regulations and standards.

C. Submit shop drawings of athletic netting, rigging and installation.

1.5 JOB CONDITIONS

A. Coordinate/schedule of equipment installation with adjacent surfaces.

PART 2 - PRODUCTS

2.1 CONCRETE: Refer to Sections “Cast-In-Place Concrete” and “Concrete Pavement and Curbs” of this specification.

2.2 TENNIS NETS AND POSTS

A. Shall be Cat. No. TSIB internal wind tennis system as manufactured by Sportsfield Specialties, Delhi, NY. Including:

1. 2 7/8’’ O.D. Galvanized 12 gauge steel posts, 3’-6” exposed height, Powder coated black with welded domed top, internal winder mechanism and removable handle.
2. Include 3” diameter x 1’-4” PVC ground sleeves.
3. 26” galv. or stainless steel ground sleeves to allow removal of tennis net posts
4. Post shall include heavy-duty lacing rods, and net hooks.
5. Provide net posts and netting system for each court, including all required net and anchors.
6. Provide (1) set of ground caps for sleeves in removed condition for each court
7. Galvanized steel ground anchor
8. Tennis Netting – Minimum Requirements:

   a. Tennis nets shall have a quad stitched white top band and a plastic coated steel cable. Cable to be 3/16” steel minimum.
   b. Material: 3.5mm braided polyethylene net body with a heavy duty polyester head-band of 64 oz vinyl with 4 rows stitching using polyester thread. Top five rows are to be double mesh.
   c. 1 ¾’’ Mesh
   d. Center Strap: Polyester webbing with nickel plated buckles and double end hook.
   e. All grommets, clips and metal accessories shall be stainless steel.
   f. Provide netting for each court

2.3 PICKLEBALL NETS AND POSTS

A. Pickleball net posts shall be Premier Round XS Pickleball Net Posts (2 7/8” O.D.), with ground sleeves, 36” ht. above ground, powder coated (black) 8 gauge steel. With welded lacing rods, internal wind self locking gear mechanism with removable handle as manufactured by Douglas Sports, Eldridge IA or approved equal.

1. Provide net posts and netting system for each court, including all required net and anchors.
2. Posts shall have welded domed top, internal winder mechanism and removable handle.
3. Include 24” long aluminum ground sleeves to allow removal of posts
4. Provide (1) set of ground caps for sleeves in removed condition for each court

B. Pickleball Netting – Provide (1) JTN 30 36”x21’-9” pickleball net for each court.:

1. Pickleball nets shall have a quad stitched white top band and a plastic coated steel cable. Cable to be 3/16” steel minimum.
2. Material: 3.0 mm braided polyethylene net body with a heavy duty polyester headband of polyester thread.
3. 1 ¾’’ Mesh

4. Center Strap: Polyester webbing with nickel plated buckles and double end hook.
5. All grommets, clips and metal accessories shall be stainless steel.

2.4 WINDSCREENS

A. Contractor shall provide complete wind & privacy system including, but not limited to, screen, ties, and hardware. Screens shall be for North and east sides of courts only.

1. 8’ high wide wind & privacy screen panels centered on 10’ ht. fence. Size panels in field based on fence, gate spacing and graphics. Sportsfield Specialties VCP9DG or approved equal.
   a. Color: Black
   b. Logo: ‘STONINGTON”. Two color White and red 6 foot ht. text.
   c. Submit proof of graphics to Owner for review and approval.
2. All fasteners and ties shall be black, UV resistant ‘break-away’ type ties.

PART 1 - EXECUTION

3.1 GENERAL

A. Install athletic equipment where and as indicated and in conformance with manufacturer recommendations.

B. Certify locations and dimensions of athletic improvements to be in conformance with current NFHS standards.

3.2 INSTALLATION OF TENNIS COURT COMPONENTS

A. Provide all materials and necessary labor for the complete installation of the net posts and nets.

B. Install net posts level, plumb and in proper alignment with the court markings.

C. All court equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

D. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Engineer’s review.

3.3 PROTECTION/CLEAN UP

A. Protect until acceptance of the project. Replace or refinish the surfaces if damaged prior to acceptance.

B. Clean up all debris from equipment installation procedures.

END OF SECTION 32 86 00

SECTION 32 91 01 – TOPSOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. This Section includes the following:

1. Testing, amending, screening, placing and finish grading all stockpiled and borrow topsoil.
2. Provide all borrow topsoil necessary to properly complete all lawn and planting operations.

B. Related Sections include the following:
1. Division 31 Section "Site Clearing".
2. Division 31 Section "Earth Moving".
3. Division 32 Section "Turf and Grasses".

1.3 QUALITY ASSURANCE

A. All work shall comply with all codes, rules, regulations, laws and ordinances for the Town, State of Connecticut, and all other authorities having jurisdiction.

B. Topsoil:

1. Testing: Representative samples of all stockpiled and borrow topsoil shall be completely analyzed/tested to determine:

a. Nutrient analysis using the Modified Morgan extractant for soil available P, K, Ca, and Mg.
b. Soil pH.
c. Organic content-determined by loss of weight on ignition.
d. Particle size analysis-sand, silt, and clay-analysis shall be determined using the hydrometer method of particle size analysis with size fractions based upon sized limits established by USDA.
e. Laboratory recommendations required for topsoil to achieve optimum nutrient levels for the establishment of lawn, trees and shrubs or special plantings (i.e. wetlands replication).

2. Testing shall conform to "Recommended Soil Testing Procedures for the Northeastern United States", Bulletin #493
3. Before delivery of any borrow topsoil, furnish the Architect with a 5 gallon sample of material.
4. Topsoil testing costs shall be borne by the Contractor.

5. Testing laboratory shall be:
   Soil Nutrient Analysis Laboratory
   Department of Plant Science
   University of Connecticut
   2019 Hillside Road, U-102
   Storrs, Ct 06269-1102
6. Contractor may submit a written request to utilize an alternate testing laboratory, to the Owner and Architect for approval. This request must include the qualifications of the proposed alternate laboratory. This laboratory may not be retained by the Contractor until written permission is received from the owner and Architect.

1.4 SUBMITTALS

A. Submit topsoil test results to the Architect for review. The Architect will be the sole judge of acceptability.

B. 5-lb sample to the Architect for visual conformance confirmation.

1.5 PRODUCT HANDLING

A. Coordinate delivery of borrow topsoil such that it is placed as delivered and no stockpiling is required.

PART 2 - PRODUCTS

2.1 BORROW TOPSOIL

A. Shall be a sandy loam, or fine loamy sand (per USDA Soil Classification index), with a minimum 50% sand content by weight not to contain materials harmful to plant life, to be clean, fertile, friable, and well draining. All topsoil to be free of any subsoil earth clods, sod, stones over 3/4" in any dimension, sticks, roots, weeds, litter and other deleterious material. Topsoil shall be uniform in quality and texture and contain organic matter and mineral elements necessary for sustaining healthy plant growth.

B. Topsoil shall have the following optimum ranges unless otherwise approved by the Architect.

   1. Organic Matter Content: 3 – 7%
   2. Acidity range: pH 6.0 to pH 7.4

C. Nutrient levels shall be achieved by the Contractor's addition of amendments to the topsoil to meet the optimum nutrient levels specified in the testing laboratory report.

2.2 STOCKPILED TOPSOIL

A. Stockpiled topsoil shall conform to all requirements of paragraph 2.1. **All** stockpiled topsoil material must be 1/2" screened, whether the material is to be used for project development, or will become excess material.

B. Provide amendments to stockpiled topsoil (organic material, sand, etc.) to produce topsoil in conformance with the Soil Nutrient Analysis Recommendations and project requirements.

C. Waste products from screening operations are the property of the Contractor and shall be removed from the site at the Contractor's expense.

PART 3 - EXECUTION

3.1 SHAPING AT ALL NEW LAWN AREAS

A. After rough grading has been completed, shape and grade lawn subgrade areas to lines and levels as noted on the drawings and as required based on total amounts of approved topsoil to allow placement of uniform depth of topsoil. Adjustments may be necessary due to field conditions. Provide all shaping adjustments at no additional cost to the Owner.

B. Cultivate and loosen the subgrade soil to min. 18" depth with a subsoiler or other approved machinery to correct over-compaction.

C. After shaping of lawn subgrades remove all sticks, stones, or foreign material one (1) inch or greater in dimension. Remove debris and stone off-site.

3.2 TOPSOIL SPREADING

A. **Do not apply topsoil to the prepared subgrade without approval by the Architect.** Once approved, no vehicular traffic will be allowed on finish subgrade. Topsoil will not be permitted to be spread until topsoil test reports have been submitted and approved. Topsoil shall not be delivered or worked in a frozen or muddy condition.

B. Uniformly distribute and spread topsoil over all graded lawn areas to conform smoothly to the lines, grades, and elevations shown or otherwise required. If directed conduct field density tests to demonstrate friable subgrade conditions. All general lawn areas to have a minimum of 6" of topsoil after compaction. All approved stockpiled topsoil is to be spread unless otherwise directed by the Owner. Maintain consistent depths of material throughout the project area.

1. Manually supply topsoil around all trees to remain. Avoid damage to root systems.

C. Topsoil shall be spread in (2) equal lifts. Bottom lift shall be thoroughly mixed with the loosened subgrade by disking, harrowing, or other approved means, to a depth of 4 inches into the subgrade, to create a transition layer.

D. Place topsoil only when it can be immediately followed by lawn development operations.

E. Supply and replace topsoil to eroded, settled or damaged areas until all lawn areas are stabilized. Care shall be taken not to damage grass or pavement areas in the replacement to topsoil.

3.3 PROTECTION

A. Remove weeds prior to lawn development operations. No weeds shall be allowed to go to seed.

B. Keep heavy equipment, trucks, etc. off areas that have received topsoil, at all times.

C. If compaction occurs, scarify to the full depth of the topsoil and regrade topsoil.

3.4 EXCESS TOPSOIL

A. Material approved for reuse but not required to be installed remains the property of the Owner and shall be delivered by the Contractor to a location within the 5 miles of the project site as designated by the Owner. Contractor shall coordinate delivery with Owner.

B. Material not approved for reuse remains the property of the Contractor and is to be removed from the site.

END OF SECTION 32 91 01

SECTION 32 92 00 – TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section "Summary."

1.2 SUMMARY

A. The work of this Section includes the following:

1. Fine grading and preparing lawn areas.
2. Furnishing and applying soil amendments.
3. Furnishing and applying fertilizers.
4. Seeding new lawns.
5. Replanting unsatisfactory or damaged lawns.
6. Maintenance of all lawns until acceptance.

B. Related Sections include the following:
1. Division 31 Section "Site Clearing".
2. Division 31 Section "Earth Moving".
3. Division 32 Section "Topsoil".
4. Division 32 Section "Plants".

C. The intent of this specification is to provide athletic fields that are high-performance, competition grade.

1.3 DEFINITIONS

A. Form 816: "Standard Specifications for Roads, Bridges and Incidental Construction", State of Connecticut, Department of Transportation, Form 816, 2004 edition, with 2005 supplement.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for the following:

1. Fertilizers.
2. Limestone.
3. Chemical preservatives and controls – also confirm that each of the materials proposed to be applied are permitted for use by the State of Connecticut.

C. Certification of grass seed from seed vendor for each grass-seed mixture and sod grown stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging. Submit topsoil test of sod source to determine compatibility of sod material with project topsoil (borrow & stockpiled).

D. Seed labels from actual bags/containers of the seed mix at the time of seeding.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of Architects and Owner, and other information specified.

F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.

1. Analysis of existing surface soil.
2. Analysis of imported topsoil.

G. Planting schedule indicating anticipated dates and locations for each type of seeding or sodding.

H. Maintenance instructions recommending procedures to be established by Owner for maintenance of lawns during an entire year. Submit before expiration of required maintenance periods.

I. The Contractor must include, in the Schedule of Values, a separate line item for "Maintenance of Lawns". This item will include all costs assigned by the Contractor, for the expenditure of labor and materials anticipated from the time of lawn establishment, until acceptance.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed lawn development work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that grass planting is in progress.
2. Athletic field contractors must have completed 5 athletic fields in the past three (3) years, similar to the design and materials specified herein.

B. Examine work to receive lawn development and notify the Architect of any defects. Specifically review the topsoil placement (depths, grades, and condition). Commencement of this work implies acceptance by Contractor of preparatory work by others.

C. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 01 Section "Project Meetings".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed, Fertilizer and Lime: Deliver in original sealed, labeled, and undamaged containers, showing weight, analysis, and name of manufacturer.

B. Sod: Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producers Association's (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing."

C. Protect materials from deterioration during delivery and while stored at site.

1.7 GUARANTEE

A. Duration of guarantee shall be until the completion of the specified maintenance period and until Owner's final acceptance of all lawn areas.

1.8 CHEMICAL CONFORMANCE

A. All chemical applications shall conform to the State of Connecticut statutes and City Integrated Pest Management (IPM) plans.

B. Contractor shall provide all necessary data and information to the Owner for amending or filing an IPM plan, including, but not limited to proposed chemicals and EPA number, applicator name and license number, and proposed application dates.

C. All fertilizer, pesticide and herbicide applications must conform to the City IPM, or in the absence thereof, must conform to the regulations of the State of Connecticut, in addition to any and all conditions listed in Division 1, Section "Project Environmental Permits" of this Specification.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts" "Rules for Testing Seeds" for purity and germination tolerances.

1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on Schedules at the end of this Section.

2.2 LIME

A. ASTM C 602, class T, agricultural ground limestone containing a minimum 50 percent total oxides (calcium oxide plus magnesium oxide), with a minimum 50 percent passing a 100 mesh sieve, and 98% passing a 20-mesh sieve, for powder form of lime.

1. Provide lime in the form of dolomitic limestone.

2.3 FERTILIZER

A. Phosphorus: Commercial, soluble; guaranteed analysis of 0-46-0.

B. Starter Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast release water soluble nitrogen, derived from natural organic sources of urea ammonium phosphate, or similar material.

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency, 14.28.14 guaranteed analysis.

C. Secondary-Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium with guaranteed analysis of 15.15.15.

D. Tertiary Fertilizer: guaranteed analysis of 46-0-0.

2.4 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew-and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Peat Mulch: Provide peat moss in natural, shredded, or granulated form, of fine texture, with a pH range of 4 to 6 and a water-absorbing capacity of 1100 to 2000 percent.

C. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, nontoxic, free of plant growth or germination inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth or germination inhibitors.

2.5 EROSION CONTROL MATERIALS

A. Material shall be a lightweight, nonwoven erosion control/revegetation blanket comprised primarily of virgin wood fiber. The blanket shall be manufactured by blending thermal mechanically – defibrated wood fiber with a small percentage of recycled synthetic fibers and forming them into a drapeable blanket. An accelerated photodegradable polypropylene netting shall be laminated to the surfaces of the blanket.

B. Material shall be similar to “Futerra”, as manufactured by Conwed Fibers of Statesville, North Carolina, or approved equal.

2.6 SALT MARSH HAY

A. Naturally harvested salt marsh hay, certified weed free.

2.7 CHEMICAL PREVENTATIVE AND CONTROLS

A. Commercial materials labeled for turf maintenance, State of Connecticut and EPA registered and approved for turf application.

2.8 WATER

A. Potable: The Contractor is responsible for furnishing all water necessary to complete the establishment and maintenance of lawns until acceptance by Owner. This requirement includes providing all water for irrigated lawn areas, if any, until the irrigation system is activated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 COORDINATION AND SCHEDULING

A. Planting Season: Sow lawn seed and install sod during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion.

B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

C. Construct lawns between August 15 and October 1, unless otherwise approved.

D. Examine areas to receive seeding or sod and notify Architect of any problems prior to commencing work. Specifically review the topsoil placement (depths, grades and conditions). Commencement of this work implies acceptance by Contractor of preparatory work of others.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavement, and other facilities, trees, shrubs, and plantings from damage caused by lawn and athletic field development operations.

1. Protect adjacent and adjoining areas from hydroseed overspraying.

B. 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.

3.4 TOPSOIL PREPARATION - GENERAL

A. Apply lime, and phosphorus at the rates recommended by the topsoil tests in all areas where topsoil has been installed. Cultivate topsoil to its full depth by scarifying or other disking methods to thoroughly incorporate amendments into the topsoil. Maintain a loose friable seed bed. At no time will rubber tired loaders or graders having greater compaction than a small farm tractor be allowed on topsoil. Keep all heavy equipment and trucks off prepared topsoil. Do not prepare while ground is wet or frozen.

B. Provide additional topsoil where and as required to properly meet all proposed finish grades.

C. Remove any weeds, debris, foreign matter and stones having any dimension greater than 3/4 inch. Remove from property.

D. Fine grade to a smooth uniform surface. The entire area shall present an even grade with no depressions where water will stand. Any protective fencing around existing trees shall be removed and disposed of by the Contractor at this time. Topsoil shall be smoothly blended to existing finish grades around erosion control devices and adjacent existing conditions, maintain existing surface drainage patterns. Round-off all top and toe of slopes. Reinstall erosion control devices and protective fencing as required.

E. **Approval of surface by Architect shall be obtained before seeding or sodding operations begin.** Where directed, perform bulk density and nuclear compaction readings to monitor degree of soil compaction/seed bed friability.

3.5 LAWN DEVELOPMENT

A. General: All disturbed areas not developed otherwise shall be developed as lawn as indicated on the Drawings and as specified.

3.6 SEEDING GENERAL LAWN AREAS

A. Ensure that the soil has been prepared in accordance with Topsoil Paragraph of this Section. All disturbed areas not developed otherwise shall be developed as lawn.

B. Seeding shall be done when wind does not interfere with uniform distribution of hydroseeding mixture.

C. Sow seed at following rates:

1. Seeding Rate: 5 lb per 1000 sq. ft.

D. Hydroseeding of general lawn areas, only, is permitted. Mix specified seed, fertilizer, and maximum 10% of fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

1. Mix slurry with non-asphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a 2-step process. Apply first slurry application at the minimum rate required to obtain specified seed-sowing rate.
3. Apply second slurry cover coat of fiber mulch at a rate of 1000 pounds per acre.

3.7 EROSION PREVENTATIVES

A. Install erosion control material on all seeded slopes one foot (1’) vertical to three (3) feet horizontal or steeper, or any seeded areas which receive concentrated run-off water, and areas as required by the Architect or Owner. Joints in these materials shall overlap no less than one foot (1’) and the material shall be secured as recommended by the manufacturer.

3.8 WATERING LAWN AREAS

A. Maintain a moist seed and sod bed at all times. Water seedbed daily with 1/4" water/day using three sets, keeping the surface moist. Apply complete coverage to insure proper germination/root growth conditions. Maintain soil moisture at or near field capacity during the period of germination and seeding development.

B. Protect all lawn areas with barricades, if necessary, to keep all traffic off the area. Repair all damage to lawn areas including topsoil replacement, at no additional cost to Owner.

C. Adjust watering requirement as required at request of Owner and after a full ground cover has been achieved.

3.9 MAINTENANCE

A. Begin maintenance of lawns immediately after each area is planted and continue until lawn is accepted, but for <u>not less</u> than the following periods.

1. Seeded Lawns: 60 days after date of first mowing, and after a minimum of 5 mowings;
2. Sodded Lawns: 45 days after date of first mowing, and a minimum of 3 mowings;

3. When full maintenance period has not elapsed before end of growing season, or if lawn is not fully established at that time, continue maintenance during the next growing season.

B. Maintain and establish all lawns by watering, fertilizing, weeding, mowing, trimming, replanting bare or eroded areas and redress to produce a uniformly smooth lawn.

C. Replant bare areas with same materials specified for lawns.

D. Add new mulch in areas where mulch has been disturbed sufficiently to nullify its purpose. Anchor as required to prevent displacement.

E. Crabgrass and broadleaf weed control.

1. General: Treat all lawn areas with crabgrass or broadleaf weed control in conformance with manufacturer's recommendations as required (after diagnosis of weed/crabgrass presence) and in conformance with all State and Local regulations.
2. Time: Conform to the manufacturer's recommendations.
3. Rate: Conform to the manufacturer's recommendations.

F. Disease Control

1. General: Treat any diseased lawn areas with disease control in conformance with the manufacturer's recommendations as required (after diagnosis of disease organisms) and in conformance with all State and Local regulations.
2. Time: Conform to the manufacturer's recommendations.
3. Rate: Conform to the manufacturer's recommendations.

G. Mow lawns as soon as there is enough top growth to cut with reel mower set at mowing height of 1-1/2"(bench height). Repeat mowing as required to maintain specified height without cutting more than 30 percent of the grass height on maximum 5 day interval. Remove no more than 30 percent of grass-leaf growth in initial or subsequent mowings. Do not mow when grass is wet.

Schedule mowing when grass attains a 2" height. Subsequent mowing to maintain following grass height. Subsequent mowings to maintain following grass height.

1. Mow grass from 1-1/2 to 2 inches high.
2. Maintain reel blade and bed knife in sharp condition and evenly matched to provide a clean cut.

H. Secondary Fertilization: Apply secondary fertilization to entire lawn and athletic field areas two (2) weeks after seeding.

I. Tertiary Fertilizations: Apply three (3) tertiary fertilizations at two week intervals (4, 6, and 8 weeks after seeding) to entire lawn and athletic field areas.

3.10 EXISTING LAWN RENOVATION

A. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish lawn where settlement or washouts occur or where regarding is required.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

D. Mow, dethatch, core aerate, and rake existing lawn.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required, Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare and compacted areas thoroughly to a soil depth of 12 inches.

H. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 6 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.

I. Apply seed and protect with straw mulch as required for new lawns.

J. Water newly planted areas and keep moist until new lawn is established.

3.11 ACCEPTABLE LAWNS

A. The Architect shall inspect all work for acceptance of lawns upon written request of the Contractor. The request shall be received at least 10 days before the anticipated date of inspection.

1. Lawn areas will not be accepted in "pieces", unless specifically agreed to by the Owner.
2. If the lawn is in acceptable condition, the Contractor's maintenance responsibility will end. If, in the opinion of the Architect, the grass stand is unacceptable, the Contractor's complete maintenance responsibilities shall continue until an acceptable stand of grass is achieved.

B. All lawns will be considered eligible for inspection and acceptance provided all requirements, including maintenance, have been met and a healthy, uniform, dense stand of grass is established, free of weeds, bare spots and surface irregularities, with coverage exceeding 90 percent over any 5 square feet selected by the Architect. The Architect will be the sole judge of acceptability. Lawns must be free of weeds, crabgrass, and other undesirable plants, with no disease present. Sodded lawns shall be free of open joints and uneven surfaces. Acceptance will not be made until all damaged areas, including areas outside the property limits, have been restored to original conditions.

C. Prior to acceptance of athletic fields, the Contractor shall perform a 6 inch deep core aeration. Allow the cores to dry, drag the cores, and topdress with a one-quarter inch depth of sand to all athletic field areas. Contractor must request a meeting with the Architect to establish specific timing of this operation.

D. In no case will any lawns be accepted prior to Substantial Completion of the overall project.

E. Replant lawns that do not meet requirements and continue maintenance until lawns are satisfactory. Upon stabilization of lawn areas, remove erosion control devices and protective fencing. Reseed bare areas as required.

3.12 WINTERIZATION

A. At the end of the growing season, prior to the on-set of Winter, all newly-seeded areas, open earthen areas, or stockpiled earth materials, must be protected from erosion. This protection must form a continuous blanket over these areas. Protection may be:

1. a hydro-seed mulch with a non-asphaltic tackifier, or;
2. straw mulch spread uniformly at a rate of 2 tons per acre to form a continuous blanket 1-1/2 inches in loose depth over the areas with a slope not exceeding 1:6.

3.13 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas. Broom clean all walks and pavements.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic, vandalism, and unauthorized use. Maintain barricades throughout maintenance period until lawn is established and accepted by the Owner.

3.14 LAWN MATERIAL INSTALLATION

A. Lawns: Provide materials in not less than the following quantities:

1. Weight of lime per 1000 sq. ft: as per topsoil test report.
2. Weight of phosphorous per 1000 sq. ft.: as per topsoil test report.
3. Weight of commercial fertilizer per 1000 sq. ft.: as per topsoil test report.
4. Cellulose Pulp 'Fiber: 32# /1,000 SF.
5. Grass Seed: 130 lbs/acre.
6. Starter Fertilizer: 310 lbs./acre.
7. Secondary Fertilizer: 300#/acre.
8. Tertiary Fertilizer 50#/acre, providing 22# of nitrogen/acre.

3.15 SEED

A. Provide fresh, clean, new –crop seed; blue tag certified complying with the tolerance for purity and germination established by the Office of Seed Analysis of North America. Provide seed of the grass species, proportions and maximum percentages of weed seed.

B. Provide seed in cleaned, sealed, properly labeled containers. Seed that is wet, moldy, or otherwise damaged will not be accepted. Handle seed to manufacturer recommendations for exposure to extremes of heat, cold, or moisture.

C. Lawn Seed Quality:

1. Weed Seed: maximum of 0.50%, no noxious weed seed.
2. Purity: minimum of 97% pure.
3. Crop: maximum 0.50%
4. Germination Rate: minimum 85%.

D. Mixture for General Lawn Areas:

TYPE OF SEED	PERCENT BY WEIGHT
Perennial Ryegrass 50% Manhattan 50% Saturn	30%
Fine leaf or Creeping Fescue 50% Pennlawn 50% Jamestown II	25%
Kentucky Bluegrass 50% Glade 50% Cobart	45%

3.16 TURFGRASS SOD

A. Provide strongly rooted sod, not less than two (2) years old and free of weeds and undesirable native grasses and machine cut to pad thickness of weeds and undesirable native grasses and

machine cut to pad thickness of 3/4" (+1/4"), excluding top growth and thatch. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).

1. General Lawn Areas

America Kentucky Bluegrass	20%
Apollo Kentucky Bluegrass	20%
Limousine Kentucky Bluegrass	20%
Award Kentucky Bluegrass	20%
Total Eclipse Kentucky Bluegrass	20%

3.17 SLOPE SEED MIX

Refer to Form 816, Section M.13.04.

END OF SECTION 32 92 00