TOWN OF CANTON

INVITATION FOR BID

Dyer Softball Field Relocation Project
Canton, Connecticut

BIDS WILL BE RECEIVED in the Office of the Chief Administrative Officer, Canton Town Hall, 2nd Floor, 4 Market Street Collinsville, CT until 2:00 pm local time on Thursday, August 26, 2021, at which time all bids will be publicly opened in the second floor Conference Room of the Canton Town Hall.

Notice

Town of Canton, CT
Invitation For Bid for Dyer Softball Field Relocation Project

The Town of Canton, Connecticut is seeking a qualified company to provide construction services for the Dyer Softball Field Relocation Project.

Proposals will be received in the Town of Canton CAO's office no later than 2:00 pm, EST on Thursday, August 26, 2021 at which time all bids will be publicly opened in the second floor Conference Room of the Canton Town Hall. The Town of Canton will reject bids received after that date and time. The Invitation For Bid may be obtained at the Town's website, www.townofcantonct.org under "Request for Proposals."

Contractors that are interested in being considered for this project shall submit one original proposal and 2 copies to:

Robert Skinner
Reference "Dyer Softball Field Relocation Project"
Chief Administrative Officer
Town of Canton
4 Market Street
PO Box 168
Collinsville, CT 06022-0168

The Town of Canton is an Equal Opportunity – Affirmative Action Employer.

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INSTRUCTIONS TO BIDDERS

INTRODUCTION

The Town of Canton (the "Town") is soliciting an invitation for bid for the Dyer Softball Field Relocation Project. This invitation is not a contract offer.

The scope of this project is described more particularly in the Invitation for Bid and the bid proposal that is a part of this bid package.

The location [Canton High School, 76 Simonds Avenue, Canton], general characteristics and principal details of the work are indicated in this invitation for bid and other references noted on this document.

Interested parties should submit a bid response in accordance with the requirements and directions set forth in this bid package. Bidders may not contact any Town employee or official concerning this Invitation other than the Town's Project Administrator as set forth in the attached documents. A bidder's failure to comply with this requirement may result in disqualification. The Town will return unopened any bid received after the date and time of bid opening.

If there are any conflicts between the provisions of these Instructions to Bidders and any other document(s) comprising this bid package, these Instructions to Bidders shall prevail.

KEY DATES

Invitation For Bid issued: July 30, 2021
Site Walk: August 9, 2021 @ 9:00 am
Bid Opening: August 26, 2021 @ 2:00 pm

SCHEDULING THE WORK

Work under this contract shall reach substantial completion within one hundred twenty (120) calendar days [unless otherwise modified or authorized by the Town/Project Administrator] from the day the contractor starts work, which date shall not be more than ten (10) calendar days from the date of written notice to begin work, unless such notice specifically instructs the contractor to begin work at a later date.
Calendar days in this contract shall mean each consecutive day including Saturdays, Sundays and legal holidays. The calendar days between November 15 and April 15 will be considered as "winter shutdown" and will not be included in computing the substantial or final completion dates.
No extensions of time will be allowed for adverse weather conditions unless the number of days of inclement Weather is substantially greater or conditions more severe than the average for the calendar period as recorded by a recognized weather observation agency and the contractor provides documentation at the end of each calendar month identifying these weather delays. Work on this project shall not be performed on Saturdays, Sundays or legal holidays except by written consent and direction of the owner.

Work shall proceed in an orderly fashion to minimize inconvenience to the abutting property owners. All contract work, including punch list items, shall reach final completion within ten (10) calendar days from the date of substantial completion.

CONTINGENCIES

The Town reserves the right to cancel this bid process and any resulting Contract at any time if the Town deems such action to be in its best interests, including but not only if either of the following conditions exists:
The Town, through changes in its requirements or methods of operation, no longer has a need for the subject matter of this Invitation; or
The Town is not satisfied with the work under the Contract, or the successful bidder fails to comply with any of the Contract's terms and conditions.

OBTAINING BID PACKAGE

The bid package – i.e., each of the documents listed on the page preceding these Instructions and collectively referred to as the "Invitation" – may be obtained at the Town's website, www.townofcantonct.org under "Request for Proposals."

BID SUBMISSION INSTRUCTIONS

Bids must be in the Town's CAO office, 4 Market Street, Collinsville CT by 2:00 p.m. on August 26, 2021. Postmarks prior to the bid opening date and time do NOT satisfy this condition. The Town will NOT accept corrections and/or modifications received after the first bid is opened publicly. Bids may not be withdrawn after bid opening, and bids must remain in effect for sixty (60) calendar days after bid opening, even if the bidder discovers errors in the bid after opening.

One (1) original bid and two (2) copies must be submitted on the accompanying Bid Form and in sealed, opaque envelopes clearly labeled with the bidder's name, the bidder's address, the words "BID DOCUMENTS," and the Bid Title and Bid Opening Date, to prevent opening prior to the bid opening date. The bidder should also complete the following forms and submit as part of the bid submission:
Disclosures
Legal Status
Bid Security
Non-Collusion Affidavit
Bidder Qualifications

The Town will reject, and not accept, bids 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 bid and inform the bidder that the bid may be resubmitted in a sealed envelope properly marked as described above.

Bids must be submitted on the prescribed form and all blank spaces for bid prices must be completed and all prices shall be stated in both words and figures. Bid prices shall include all labor, materials, equipment, tools, transportation, and incidentals thereto necessary to perform the work in accordance with the Contract Plans and Specifications and First Class Work of the type being bid. The person signing the bid must initial errors, alterations or corrections on both the original bid and all required copies. Ditto marks or words such as "SAME" shall not be used in the Bid Form.
Bids may be withdrawn personally or in writing provided that the Town receives the withdrawal prior to the time and date fixed for the bid opening. Bids are considered valid

for sixty (60) calendar days after bid opening, to permit the Town the time to review the bids and to investigate the bidders' qualifications prior to awarding the bid. Bidders may not withdraw, cancel or modify their bid for a period of sixty (60) calendar days after the bid opening or the Bidder shall forfeit its Bid Security.
An authorized person representing the legal entity of the bidder must sign the bid.

UNIT PRICES AND LUMP SUM PRICES

The unit prices for each of the several items in the bid shall include the prorated share of overhead and profit so that multiplying the quantity shown for each item by the unit price bid represents the total bid for that item. The town may reject any bid not conforming to this requirement. Bidders should note this provision because, if conditions make it necessary for the town to revise the quantities, no limit shall be fixed for such increased or decreased quantities, nor extra compensation allowed.
Lump sum prices for each of the several items in the bid shall include its prorated share of overhead, profit, and all costs associated with that item. The lump sum price represents the entire compensation that the town shall pay for all of the work associated with the item. The town retains the right, as best serves the town, to select all or part of the bid items as part of the award of this bid.

QUESTIONS

Questions concerning the bid process and procedures are to be in writing and directed only to:
Name: Glenn Cusano – Project Administrator
E-mail: gcusano@townofcantonct.org

Bidders may not contact any other Town employee or official concerning this Invitation. A bidder's failure to comply with this requirement may result in disqualification.
If a bidder finds any omission, discrepancy or error in, has questions concerning, or seeks an exception to anything in the documents constituting this Invitation; it should notify the Town as soon as possible but not less than five (5) business days before the date of the bid opening. The bidder must direct that inquiry to: Glenn Cusano, email address: gcusano@townofcantonct.org. No oral statement of the Town shall be effective or binding to modify any of the provisions of this Invitation.
However, the Town will not make any oral interpretations to any bidder as to the meaning of any bid documents or portions thereof, and no bidder shall rely on any alleged oral interpretation. A bidder shall request an interpretation in writing to Glenn Cusano, email address: gcusano@townofcantonct.org.

ADDENDUM/ADDENDA

At least five (5) calendar days prior to the bid opening, **the Town will post a copy of any and all addendum or addenda on the Town's website, www.townofcantonct.org, under "Request for Proposals."** Said addendum or addenda; which shall be a part of this Invitation/Bid and the resulting Contract; containing all questions received as provided for above and decisions regarding same. Each bidder is responsible for checking the website to determine if the Town has issued an addendum or addenda and, if so, to complete its bid in accordance with the Invitation as modified by the addendum/addenda.

COSTS FOR PREPARING BID

This Invitation does not commit the Town to pay any costs incurred by bidders in preparing their responsive bids. Each bidder agrees that all costs it incurs in developing its bid are its sole responsibility.

OWNERSHIP OF BIDS

All bids submitted become property of the Town.

FREEDOM OF INFORMATION ACT

All information submitted in a bid or in response to a request for additional information is subject to disclosure under the Connecticut Freedom of Information Act as amended. A bidder's responses may contain financial or other data that it claims constitute proprietary or confidential information or a trade secret. To protect such data from disclosure, a bidder should identify specifically the pages that contain claimed confidential information by visibly marking all such pages of the bid.

REQUIRED DISCLOSURES AND BIDDER'S QUALIFICATIONS

In its bid each bidder must:

- State its inability to meet any specified requirement of the Invitation;
- Make a complete disclosure of all resolved and pending mediation, arbitration and litigation matters in which the bidder or its principals (regardless of their place of employment) have been involved for the most recent five (5) years;
- Make a complete disclosure of each instance of its or its principals' (regardless of their place of employment) conviction, guilty plea, nolo contendere plea, finding of civil liability or criminal responsibility in any civil action or for any criminal offense, except motor vehicle infractions; and
- Make a complete disclosure of each instance of its or its principals' (regardless of their place of employment) finding of a violation of any state or local ethics standards or other offense arising out of the submission of bids or proposals, or performance of work on public works projects or contracts.

A bidder's acceptability based on these disclosures and any investigation the Town deems necessary to determine a bidder's ability to perform the work described in this Invitation shall lie solely with the Town.

CONFLICT OF INTEREST

By submitting a bid, a bidder certifies that it has no conflict of interest as defined in the Town's Ordinance # 230 concerning ethics. The Town shall review all bids under this provision and may reject any bid where, in the Town's opinion, the bidder could be in a conflict of interest or could be perceived to be in a possible conflict of interest position if the bidder were to become a party to the Contract.

DEBARRED CONTRACTORS

The Town will reject any bid from a bidder that is on a debarred contractor list of the United States and/or the State of Connecticut.

LEGAL STATUS

Each bidder must complete the Bidder's Legal Status Disclosure form and must, if required, have a current license or registration to do business in the State of Connecticut that is on file with the Connecticut Secretary of the State's Office. The Town may, in its sole discretion, request acceptable evidence of any bidder's legal status.

BID SECURITY

No bid security required.

PRESUMPTION OF BIDDER'S FULL KNOWLEDGE

At the time the first bid is opened, the Town will presume that each bidder has read and understood each document comprising this Invitation and any addenda posted on the Town's website. A bidder's failure and/or omission to receive or examine any information concerning this Invitation shall in no way relieve it from any aspect of its bid or the obligations related to it.

At the time the first bid is opened, the Town will also presume that each bidder is familiar with and will comply with all federal, state and local laws, ordinances and regulations that in any manner relate to this Invitation and the performance of the work described in it.

By submitting a bid, each bidder represents that it has thoroughly examined and become familiar with the scope of work outlined in this Invitation and it is capable of performing the work to achieve the Town's objectives.

Each bidder shall visit and examine the location of and the routes to be used during the work described in this Invitation and thoroughly familiarize itself with all actual conditions of the property before preparing its bid. The submission of a bid shall be construed as an assurance that such examination has been made, and the Town will not recognize or award claims for compensation for additional labor, equipment or materials for difficulties encountered.

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). No exemption certificates are required, and none will be issued. The successful bidder will be provided the Town of Canton's Federal Tax Exempt #. Bidders shall avail themselves of these exemptions.

INSURANCE

The successful bidder shall, at its own expense and cost; obtain and keep in force during the entire duration of the work and during the completed operations period that is the subject of this Invitation; the insurance coverage set forth in Article 67 of the General Conditions of these Contract Documents.

AWARD CRITERIA; SELECTION; CONTRACT EXECUTION

The Town reserves the right to accept the bid that, all things considered, is in the best interests of the Town. Although price will be an important factor, it will not be the only basis for award. Due consideration will also be given to a bidder's experience, references, service, ability to respond promptly to requests, past performance satisfactory to the Town, and other criteria relevant to the interests of the Town, including the bid documents' compliance with the procedural requirements stated in this Invitation.

The Town has adopted a Local Bidders Preference Policy that is included below.

LOCAL BIDDER PREFERENCE POLICY

On any item, project or service which value exceeds $7,500 or which is advertised through a competitive bid process and in which there is a qualified Town Based Resident Bidder, the lowest responsible bidder shall be determined in the following order:

1. A Town Based Resident Bidder which has submitted a bid not more than 10% higher than the lowest responsible bid may be awarded the bid provided such Town Based Resident Bidder agrees to accept the award of the bid at the amount of the lowest responsible bidder.

2. If more than one Town Based Resident Bidder has submitted a bid not more than 10% higher than the lowest responsible bid, the lowest responsible bidder shall be the Town Based Resident Bidder which submitted the lowest bid.

3. Otherwise, the award will go to the lowest responsible bidder who would qualify if there were no Town Based Resident Bidder.

Any local vendor meeting the requirements of a Town Based Resident Bidder, as defined below, responding to the solicitation shall be required to submit a signed Local Bidder Affidavit Form with the bid submittal. Failure to submit an affidavit form, may at the option of the Town, result in disqualification as a local vendor and ineligibility for contract award as a Town Based Resident Bidder.

The term "Town Based Resident Bidder" shall mean any business with a principal place of business located within the Town of Canton. A business shall not be considered to be a Town Based Resident Bidder unless evidence to establish that such business has a bona fide principal place of business in Canton is included with each bid submitted by the business. Such evidence may include documentation of ownership, or a long-term lease on the real estate from which the principal place of business is operated or payment of property taxes on the personal property of the business to be used in the performance of the bid.

The Local Bidder Preference process shall not apply under the following circumstances:

1) Professional services contracts which are awarded on subjective criteria in addition to cost.

2) Contracts using state, federal or other funds that have regulations disallowing such practice.

3) If the qualified Town Based Resident Bidder is not current in the payment of all local taxes.

1) Bids made through regional organizations or state agencies such as state contracts, CRCOG or CIRMA, when the product or services offered have already been selected through a competitive process.

2) Bids received through a reverse auction process.

The Town will not award the bid to any bidder who is in arrears or in default to the Town on any debt, contract, security or any other obligation.
The Town reserves the rights, in its sole discretion: to accept any, all, or any part of bids; to reject any, all, or any part of bids; to waive any non-material deficiencies or clerical errors in the bidding process or bid; and to award the bid that in its judgment will be in the Town's best interests. The Town also reserves the right to award the purchase of individual items under this Invitation to any combination of separate bids or bidders. All bids will be publicly opened and read aloud as received on the date, at the time, and at the place identified in this Invitation. Bidders may be present at the opening.
The Town may correct, after bidder verification, any mistake in a bid that is obviously a clerical error, such as a price extension or decimal point error. 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 will select the bid that it deems to be in the Town's best interest and issue a Notice of Conditional Award of Bid to the successful bidder. The conditional award shall be subject to further discussions with the bidder that are deemed necessary by the Town and to the successful bidder's provision of the documents required by this Invitation and the execution of a Contract in the form contained in this Invitation. The successful bidder's failure to provide each required form or execute the Contract within ten (10) business days of the date of the Notice of Conditional Award of Bid shall be grounds for the Town to declare the bid withdrawn, to call the bid security, and/or to enter into discussions with another bidder.
The Town will post the bid results and award recommendation on the Town's website, www.townofcantonct.org, under "Request for Proposals."
The Bid Awarded and Contract Execution dates listed in the instructions to bidders section are anticipated, not certain, dates.

SUPPLIER DIVERSITY (SET-ASIDE-GOALS)

The contractor who is selected to perform this Town service must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5. An Affirmative Action Plan must be filed with and approved by the Commission on Human Rights and Opportunities prior to the commencement of service.

State law requires a minimum of twenty-five (25%) percent of the state –funded portion of the contract for award to subcontractors holding current certification from the Connecticut Department of Administrative Services (DAS) under the provisions of CONN. GEN. STAT. § 4a-60g, as amended (25% of the work with DAS certified Small and Minority owned businesses and 25% of that work with DAS certified Minority, Women and/or Disabled owned businesses). The contractor must demonstrate good faith effort to meet the 25% set-aside goals.

For municipal public works contracts and quasi-public agency projects, the contractor must file a written or electronic non-discrimination certification with the Commission on

Human Rights and Opportunities. Forms can be found at
http://www.ct.gov/opm/cwp/view.asp?a=390928&opmNav_GID=1806

NONDESCRIMINATION CERTIFICATION – Affidavit
By Entity

For Contracts Valued at $50,000 or More

Documentation in the form of an affidavit signed under the penalty of false statement by a chief executive officer, president, chairperson, member or other corporate officer duly authorized to adopt corporate, company, or partnership policy that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60a, as amended.

COLLUSION

Each bidder shall complete the Non Collusion Affidavit that is a part of this Invitation. Any act(s) of misrepresentation or collusion in connection with a bid may be a basis to disqualify a bid submitted by the bidder responsible for said misrepresentation or collusion. In the event that such conduct is discovered after the execution of the Contract, the Town may terminate the Contract without incurring any liability, penalty, damages or other loss.

ADVERTISING

The successful bidder may not name the Town in its advertising, news releases, and promotional efforts without the Town's prior written approval.
If it chooses, the successful bidder may list the Town in a statement of references or similar document required as part of a public bid. The Town's permission to the successful bidder to do so is **not** a statement about the quality of the successful bidder's work or the Town's endorsement of the successful bidder or its work.

W-9 FORM

The successful bidder must provide the Town with a completed W-9 form before commencing work.

PAYMENTS

Payments will be made within thirty (30) calendar days after the appropriate Town officer receives and approves the invoice, unless otherwise specified in the Technical Specifications.

TOWN INSPECTION OF WORK

The Town may inspect the successful bidder's work at all reasonable times. This right of inspection is solely for the Town's benefit and does not transfer to the Town the responsibility for discovering patent, latent, or other defects. The successful bidder has the sole and exclusive responsibility for performing in accordance with the Contract.

REJECTED WORK OR MATERIALS

The successful bidder, at its sole cost and expense, shall remove from the Town's premises rejected items, commodities and/or work within 48 hours of the Town's notice of rejection. Immediate removal may be required when safety or health issues are present.

If the contractor fails to remove rejected work in a timely manner, the Town may arrange to have such rejected work removed and deduct associated costs from payments due to the contractor.

MAINTENANCE AND AVAILABILITY OF RECORDS

The successful bidder shall maintain all records related to the work described in the Invitation for a period of three (3) years after final payment under the Contract or until all pending Town, state and federal audits are completed, whichever is later. Such records shall be available for examination and audit by Town, state and federal representatives during that time.

REPRESENTATION OF TOWN

In performing the work described in the Invitation, the successful bidder, its agents and employees shall act in an independent capacity and shall not act as officers, employees or agents of the Town.

SUBCONTRACTING

The successful bidder agrees not to enter into any subcontracting agreement for any or all of the work described in the Invitation without obtaining the Town's prior written consent. All subcontracting shall be subject to the same terms and conditions as are applicable to the successful bidder. The successful bidder shall be fully and solely responsible for the performance of and payments to any subcontractors. The contractor shall not award more than 49% of the contract value to anyone subcontractor.

COMPLIANCE WITH LAW

The successful bidder 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 bid and the performance of the work described in the Invitation and these specifications. The successful bidder shall commit no trespass on private property in performing any of the work described in the Invitation. By submitting a bid, the successful bidder covenants that it has complied, and during the term of the Contract will comply, with the obligations under the Immigration Reform and Control Act ("IRCA") and that all employees it assigns to the Contract are authorized for employment in the United States of America. The successful bidder further covenants that it has properly completed, and during the term of the Contract will properly complete, I-9s for all employees assigned to the Contract. The successful bidder agrees to defend, indemnify and hold the Town harmless in the event that any of the successful bidder's employees provided under the Contract is found not to be authorized to work under the law or in the event that there is a determination that the successful bidder has failed to comply with IRCA's obligations, including but not limited to the failure to prepare correctly and maintain I-9s. The successful bidder further agrees to defend, indemnify and hold harmless the Town from and against any and all claims brought against the Town as a result of these obligations, including but not limited to settlement fees, judgments, attorneys' fees and costs. These defense, hold harmless and indemnity obligations shall survive the Contract's termination or expiration.

LICENSES AND PERMITS

The successful bidder shall, for the term of the Contract, have and provide proof of all permits and licenses required by the Town and/or any other state or federal authority.

The successful bidder shall immediately and in writing notify the Town of the loss or suspension of any such license or permit.

SECURITY: PERFORMANCE, AND PAYMENT

At the time of Contract execution, the successful bidder shall file with the Town security in an amount not less than one hundred percent (100%) of the total bid for, which security shall be for both the satisfactory performance of the work including all labor and materials. Such security shall be in the form of either surety bond(s) or the successful bidder's certified check. The surety bond(s) shall be prepared in the form of the Performance Bond, and the Labor and Material Payment Bond, made a part of this Invitation, duly executed by the bidder and the surety and shall be subject to the review and approval of the Town's legal counsel. The bidder's surety shall be licensed by the State of Connecticut and listed by the US Department of the Treasury in Circular No. 570. The Town may accept a certified check in lieu of a surety bond, subject to review and approval of the Town's legal counsel. The bidder's bank shall be licensed and insured by the State of Connecticut and the Federal Deposit Insurance Corporation. The failure of the Town's legal counsel to approve the form of such security shall be grounds for the Town to reject the bid.
The successful bidder shall provide the Town with such security prior to the start of each Contract year in an amount the Town estimates for the work anticipated for that Contract year. Failure to provide such security shall be grounds to terminate the Contract.

NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY

During the term of the Contract, the successful bidder agrees to be an equal employment opportunity employer and will not discriminate as to race, color, creed, sex, national origin, marital status, physical or mental disability or any other protected classification under state and federal law.

END OF INSTRUCTIONS TO BIDDERS

WAGE AND PAYROLL

REQUIREMENTS

PREVAILING WAGE LAWS IN CONNECTICUT

Conn. Gen. Stat. Section 31-53(g) provides monetary thresholds which must be met before the law is applicable. The prevailing wage law does not apply where the ***total cost of all work to be performed by all contractors and subcontractors*** in connection with new construction of a public works project is less than four hundred thousand ($400,000) dollars. The prevailing wages law does not apply where the ***total cost of all work to be performed by all contractors and subcontractors*** in connection with remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project under one hundred thousand ($100,000) dollars.

CONTRACTOR/BIDDER'S RESPONSIBILITY REGARDING PREVAILING WAGE LAW:

If the Contractor's/Bidder's total contract bid price for all work included under this contract, as listed in the submitted Bid Proposal, is equal to or greater than the limits listed above as applicable under said law; then the Contractor's/Bidder's unit prices and lump sum prices submitted herein and the resulting total contract bid price submitted herein should be based on the applicable Prevailing State Wage Rates; and it will further be the Contractor's/Bidder's responsibility to obtain the current applicable Prevailing Wage Rates from the State of Connecticut – Department of Labor and meet all requirements therein of the Law and the State of Connecticut.

AGREEMENT

This Agreement (the "Agreement") is entered into the _____ day of _____ 2021 by and between the Town of Canton, a political subdivision of the State of Connecticut (the "Owner") and _____

_____ (the "Contractor").

WHEREAS, the Owner has issued an Invitation for Bids for Dyer Softball Field Relocation Project, Canton, Connecticut (the "Premises"); and

WHEREAS, Contractor submitted a proposal to the Owner on August 26, 2021, for the Work; and

WHEREAS, the Owner and the Contractor desire to enter into a formal Agreement for the performance of the Work;

THEREFORE, in consideration of the recitals set forth above and the mutual promises by the parties below, the parties agree as follows:

1. General. The Contractor agrees to perform the Work in accordance with the Contract Documents (as set forth below). The Contract Documents represent the entire and integrated agreement between the Owner and the Contractor and supersede all prior negotiations, representations or agreements, whether written or oral.

2. Duties. Contractor shall perform the Work described in the Contract Documents except for any work that is specifically prescribed in the Contract Documents to be the responsibility of another person. Contractor shall furnish all labor, equipment, trucks, materials, tools, facilities, supplies, transport, and any other things necessary to carry out the Work in a first-class manner for work of this type.

3. Permits and Standards. Contractor shall, at its own expense, obtain all required permits and agreements from the Town of Canton, federal, state or other governmental authority for performance of the Work in accordance with the standards prescribed by the federal Environmental Protection Agency, the Occupational Safety and Health Administration, NIOSH, the Department of Energy and Environmental Protection of the State of Connecticut and any other federal, state or local government laws and regulations. In the event of a conflict or overlap of any such laws or regulations, the most stringent provisions shall be applicable.

4. Compliance with Laws. Contractor shall comply with all federal, state and local laws, ordinances, regulations and applicable permits governing the Work whether or not such laws and regulations are fully and properly included as part of this Agreement.

5. Schedule. The Work under this Contract will be given to the Contractor using Work Orders. The Work shall be completed within the number of calendar days required to complete each assigned Work Order as agreed to prior to the issuance of the Work Order. The Contractor shall commence with the Work of any assigned Work Order within ten days after receipt of signed [by the Town] Work Order. The rate of progress shall be such that the work shall be performed and completed in accordance with the contract before the expiration of the time limit stipulated, which time is of the essence of the Agreement. Failure by the Contractor to complete the Work of any Work Order as agreed to by both parties may be grounds for terminating this Contract.

6. Payment. The Owner will pay the Contractor in accordance with the Contract Documents and agreed upon unit prices for Work in place. Payment will be made by the Owner monthly within 30 days after the approval of the Contractor's Application for Payment as provided in the Contract Documents less retainage of five percent (5%).

6. Insurance. The Contractor shall carry and keep in force during the term of this Agreement completed operations period all insurance as more specifically described in the Contract Documents by a company or companies authorized to do business in Connecticut. The Company shall provide certificates of insurance and endorsements or insurance policies specifying such coverage and naming the Town and its officers, agents, employees and volunteers as additional insured prior to the start of the Work and on an annual basis. In the event of any conflict between the insurance requirements set forth below and insurance requirements set forth in other Contract Documents, the requirements in this Agreement shall control.

The Contractor shall provide the following coverages and minimum limits of insurance:

3) Worker's Compensation Insurance:
Statutory Coverage

Employer's Liability

$1,000,000 each accident/$1,000,000 disease-policy limit/$1,000,000 disease each employee

4) Commercial General Liability:

Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.

Limits of Liability for Bodily Injury and Property Damage

Each Occurrence $1,000,000

Aggregate $2,000,000

5) Automobile Insurance:
Including all owned, hired, borrowed and non-owned vehicles and pollution

Limit of Liability for Bodily Injury and Property Damage:

Per Accident $1,000,000

1) Umbrella

Each Occurrence $5,000,000

Aggregate Limit $5,000,000

The Contractor and the Contractor's subcontractors, if any, shall cause the commercial liability coverage required by the Contract Documents to include (1) the Town and its officers, agents, volunteers and employees, as additional insured for claims caused in

whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Town and its officers, agents, volunteers and employees as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. The Contractor shall, before commencement of its Work, submit to the Town evidence of the aforementioned requirements from itself and its subcontractors, if any, in the form of an additional insured endorsement or insurance policy acceptable to the Town. Failure by the Contractor to provide the endorsements required in this section shall entitle the Town to withhold payment from the Contractor then due or to become due until such time as the endorsements or policies are provided. The insurance (both primary and umbrella coverage's) of the Contractor and the Contractor's subcontractor's, if any, shall be primary to any insurance that may be available to the Town and its officers, agents, employees and volunteers and any insurance available to the Town and its officers, agents, employees and volunteers is secondary and non-contributory. The policies of insurance or endorsements as provided herein shall state that the insurance of the Contractor and the Contractor's subcontractor's, if any, (both primary and umbrella coverage's) shall be primary to any insurance that may be available to the Town and its officers, agents, employees and volunteers and any insurance available to the Town and its officers, agents, employees and volunteers is secondary and non-contributory. The Contractor and the Contractor's subcontractor's, if any, shall cause their insurers to directly provide the Town with thirty (30) days advance notice of cancellation. The Contractor and the Contractor's subcontractor's, if any, shall cause their insurers to directly provide the Town with ten (10) days advance notice of cancellation for non-payment. The insurance obligations provided herein shall survive the termination and/or cancellation and/or full performance of this Agreement.

8. Contract Documents. The Contract Documents include, without limitation, the following:

(i) The Agreement
(ii) The Owner's Invitation for Bid and Instructions to Bidders
(iii) Drawings – if included as part of the bid documents
(iv) The Contractor Bid Proposal
(v) Specifications and/or Special Provisions
(vi) General Conditions and documents referenced therein
(vii) Any modifications issued after the execution of this Agreement.

9. No Assignment. The Contractor shall not subcontract, transfer or assign its obligations under the Contract Documents or any portion thereof without the prior written consent of the Owner. Any assignment or attempted assignment without the Owner's written consent shall not relieve the Contractor of its obligations under this Agreement and such assignment shall be null and void and have no legal effect.

10. Contractor Personnel Must Be Authorized to Work. The Contractor confirms that it has complied with the obligations under the Immigration Reform and Control Act (IRCA) and that the employees, independent contractors and other personnel it provides under this Agreement are authorized for employment in the United States. The Contractor further confirms that it has properly completed I-9s for all employees assigned to the Owner's place of business. The Contractor agrees to hold harmless and indemnify the Owner in the event that any of the employees or other personnel provided by the Contractor are found not to be authorized to work under the law or in the event that there is a determination that the obligations set forth under IRCA, including, but not limited to, the failure to correctly prepare and maintain I-9s, have not been complied with by the

Contractor. The Contractor agrees to indemnify, defend and hold the Owner harmless against any claims brought against the Contractor or the Owner as a result of these obligations, including but not limited to, settlement fees, judgments and attorneys' fees and costs.

11. Compliance with Laws. The Contractor shall perform the Work in compliance with any and all applicable local, state and federal laws or regulations. The Contractor agrees to indemnify, defend and save harmless the Owner and its officers, agents, volunteers and employees, from and against all loss or expense, (including costs and attorneys' fees), arising out of or resulting from the Contractor's failure to perform the Work in accordance with all applicable laws and regulations. The defense and indemnity obligations provided herein shall survive the termination and/or cancellation and/or full performance of this Agreement.

1. Execution. This Agreement may be executed in two or more counterparts, each of which shall be considered an original instrument, but all of which shall be considered one and the same agreement, and shall become binding when one or more counterparts have been signed by each of the parties hereto and delivered (including delivery by facsimile) to each of the parties.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the day and year first written above.

THE TOWN OF CANTON

Witness:

By _____
Robert Skinner
Chief Administrative Officer

_____

Date: , 2021

_____

Witness:

By

_____ _____
Contractor

_____

Date: , 2021

PERFORMANCE BOND

Bond Number

KNOW ALL MEN BY THESE PRESENTS:

That _____, as Principal, hereafter called Principal, and _____, as Surety, hereinafter called Surety are held and firmly bound unto the Town of Canton as Oblige, hereinafter called Owner, in the amount of _____ and _____ Dollars ($ _____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, by these presents.

WHEREAS, Principal has by written Agreement dated _____ entered into a Contract with the Owner for:

"Dyer Softball Field Relocation Project"

Which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

The Surety hereby waives notice of any alterations or extensions of time made by the Owner.

WHEREAS, Principal shall be, and declared by the Owner to be in default under the Contract, the Owner having performed the Owner's obligations thereunder, the Surety shall promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions; or,

2. Obtain a Bid or Bids for submission to the Owner for completing the Contract in accordance with its terms and conditions, and upon determination by the Owner of the lowest qualified responsible Bidder, arrange for a Contract between the Bidder and the Owner, and make available as Work progresses sufficient funds to pay the cost of completion of the Contract.

Any suit brought under this Bond must be instituted before the expiration of three (3) years from the date on which final payment under this Contract is rendered.

This Bond is issued simultaneously with another Bond in favor of the Town of Canton conditioned for full payment of Labor and Materials.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Owner named herein or the executors, administrators, or successors of the Owner.

Signed and sealed this_____ day of _____ , 20_____.

(Seal of Principal)

_____
(Principal)

In the Presence of:

By:

_____
(Witness)

_____

(Witness)

(Seal of Surety)

(Surety)

_____ By:
(Witness)

_____
(Witness)

(Power of Attorney for person signing for Surety Company must be attached to the Bond)

LABOR AND MATERIAL
PAYMENT BOND

Bond Number

KNOW ALL MEN BY THESE PRESENTS:

That _____, as Principal, hereafter called Principal, and _____, as Surety, hereinafter called Surety are held and firmly bound unto the Town of Canton as Oblige, hereinafter called Owner, in the amount of_____ and Dollars ($ _____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, by these presents.

WHEREAS, Principal has by written Agreement dated _____ entered into a Contract with the Owner for:

"Dyer Softball Field Relocation Project"

Which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

This Bond is issued simultaneously with another Bond in favor of the Town of Canton conditioned for the full and faithful performance of the Contract.

The Surety hereby waives notice of any alterations or extensions of time made by the Owner.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay for all labor and materials furnished by 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 provisions of Sections 49-41, 49-42, and 49-43 of the Connecticut General Statues, and the rights and liabilities hereunder shall be determined and limited by said Sections to the same extent as if they were copied at length herein.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Owner named herein or the executors, administrators, or successors of the Owner.

Signed and sealed this_____ day of _____ , 20_____.

(Seal of Principal)

(Principal)

In the Presence of:

_____ By:
(Witness)

_____
(Witness)

(Seal of Surety)

(Surety)

_____ By:
(Witness)

_____
(Witness)

(Power of Attorney for person signing for Surety Company must be attached to the Bond)

TOWN OF CANTON, CONNECTICUT
GENERAL CONDITIONS

Article 1: Definitions

Wherever used in these General Conditions or in the other Contract Documents, the following terms shall have the meanings which shall be applicable to both the singular and plural thereof:

(a) Agreement or Contract: The written agreement between the Owner and the Contractor covering the Work to be performed. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral.

(b) Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

(c) Bidder: Any person, firm or corporation submitting a Bid for the Work.

(d) Bonds: Performance and labor materials payment bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the Contract Documents.

(e) Change Order: A written order to the Contractor signed by the Owner authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time issued after execution of the Agreement.

(f) Contract Documents: The Instructions to Bidders, General Conditions,, the Agreement, Specifications, Drawings, Addenda (whether issued prior to opening of Bids or execution of the Agreement), Modifications once executed or issued after the execution of the Contract, and such other information as may be included with the Contract Documents.

(g) Contract Price: The total monies payable to the Contractor under the Contract Documents for the Work.

(h) Contract Time: The number of calendar days or the milestone dates set forth in the Contract Documents to complete the Work so that the Work is ready for its intended use as determined by the Owner and Engineer.

(i) Contractor: The person, firm or corporation with whom the Owner has executed the Agreement.

(j) Drawings: The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams which have been prepared or approved by the Engineer.

(k) Engineer: Wherever in the Contract Documents the word “Engineer” is used, it shall be understood as referring to the Project Administrator acting personally or through his authorized assistants or an independent engineer engaged by the Owner.

(l) Inspector: The authorized representative of the Engineer or Owner who is assigned to the Project or any parts thereof.

(m) Modification: (a) a written amendment of the Contract Document signed by both parties; (b) a Change Order; (c) a written clarification of interpretation issued by the Engineer or (d) a written order for a minor change or alteration in the Work issued by the Engineer. A Modification may only be issued after execution of the Agreement and must be in writing.

(m) Owner: Town of Canton acting through its First Selectman or the Chief Administrative Officer or their Agent(s).

(n) Project: The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

(o) Shop Drawings: All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a subcontractor, manufacturer, supplier or distributor and which illustrate the equipment, material or some portion of the Work.

(p) Specifications: The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

(q) Subcontractor: An individual, firm or corporation having a direct Contract with the Contractor or with any other Subcontractor for the performance of a part of the Work for the Project.

(r) Engineer: todesign, 114 West Main Street, Suite 202, New Britain, CT 06051.

(s) Work: Any and all obligations, duties and responsibilities necessary to the successful completion of the Project assigned to or undertaken by the Contractor under the Contract Documents, including the furnishing of all labor, materials, equipment and other incidentals.

Article 2: Progress and Submission Schedules,; Preconstruction Conference; Time of Starting the Work

(t) Within ten days after execution of the Agreement, the Contractor shall submit to the Owner and Engineer for approval, a critical path method schedule indicating the starting and completion dates of the various portions of the Work. Such schedule shall be updated monthly and is a condition to the Owner's obligation to pay the Contractor. The schedule shall identify and indicate the submission of all required shop drawings and product data required by the Contract Documents and indicate the time allowed by the Contract Documents for approval or disapproval of same by Engineer. The Contractor acknowledges that the Owner owns any float indicated in the Contractor's schedule.

(u) Before starting the Work, a conference shall be held to review the above schedules, to establish procedures for handling submissions and for processing Applications for Payment, and to establish a working understanding between the parties as to the Work.

(v) Within ten (10) calendar days after Notice of Award and prior to executing the Agreement the Contractor shall furnish the Owner and Engineer acceptable Certificates of Insurance, endorsements or insurance policies as required by the Contract Documents.

(d) The Contractor shall start the Work on the date on which the Agreement is executed and delivered, or on such other date, as may be specified in the Agreement. However, at the time of the execution and delivery of the Agreement the Owner may give the Contractor a written Work Order to proceed, stating a different date on which it is expected that the Contractor shall start the Work.

(w) The Contract Time shall commence to run on the date when the Work is to start as provided in the above paragraph.

Article 3: Correlation, Interpretation and Intent of Contract Documents

(x) It is the intent of the Contract Documents to describe the entire Work to be performed by the Contractor in accordance with the Drawings, Specifications, and other parts of the Contract Documents. The Contract Documents comprise the entire Agreement between the Owner and the Contractor. They may be altered only by a Modification.

(y) The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

(z) Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. It shall be the Contractor's responsibility in subcontracting portions of the Work, to arrange or group items of Work under particular trades to conform with then-prevailing customs of the trade, and in accordance with applicable requirements of law. The Owner shall have no liability arising out of jurisdictional issues raised or claims advanced by Subcontractors, trade organizations or other interested parties based on the arrangement or subdivision of Work in the Contract Documents. In the event of any claim arising out of any duplication, conflict, inconsistency or discrepancy within the Contract Documents as to the allocation of the Work among the Subcontractors and Contractor's own forces, the Contractor shall be solely responsible for resolving the claim and shall be responsible for ensuring that all the Work is completed regardless of where it appears in the Contract Documents.

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

(bb) The terms "knowledge," "recognize," "discover," and "observe," their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor shall be interpreted to mean that which (1) the Contractor knows, recognizes, discovers and observes, and (2) the Contractor should, in exercising the care, skill, and diligence required by the Contract Documents, know, recognize, discover or observe, as the case may be. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a party familiar with the Project and exercising the care, skill, and diligence required by the Contract Documents (including any Work that the party should be able to reasonably anticipate or infer based on Contract Documents then existing).

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

(cc) Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents. The Contractor shall promptly report to the Engineer any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Engineer may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

(ee) The Contractor shall conduct its inspection and review of the Contract Documents as provided herein well in advance of the Work or portion thereof as to afford the Engineer sufficient time to correct or otherwise supplement the Contract Documents in the event of an error, omission or inconsistency therein. The Contractor shall also allow sufficient time for the Contractor to assess the impact of such error, omission or inconsistency and for the Owner to evaluate same. If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Engineer issues in response to the Contractor's notices or requests for information, the Contractor shall make Claims as provided in this Agreement If the Contractor fails to perform the obligations of paragraphs (g) and (h), the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Engineer for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

(ff) After reporting to the Engineer any error, inconsistency or omission the Contractor may discover in its review of the Contract Documents, the Contractor shall not proceed with any Work so affected without the Engineer's written modification to the Contract Documents unless otherwise directed in writing by the Owner. In the event that the Contractor proceeds with the Work so affected prior to the Engineer's written response or written direction from the Owner, then Contractor shall be responsible for the cost of remedial work in the event the Contractor's actions are inconsistent with the Engineer's written modification(s) to the Contract Documents or written direction from the Owner.

(k) In the event of a conflict or discrepancy in the Contract Documents, the greater quantity, higher quality, more expensive item, process, procedure or cost of Work shall control as reasonably determined by the Engineer.

Article 4: Copies of Documents and Record Documents

(gg) The Owner shall furnish the Contractor up to five (5) copies of the Specifications and Drawings as are reasonably necessary for the execution of the Work. Additional copies shall be furnished, upon request, at the cost of reproduction.

(hh) The Contractor shall keep three (3) record copies of all Specifications, Drawings, Addenda, Modifications and Shop Drawings in good order and annotated to show all changes made during the Work. These shall be available to the Engineer during the course of the Work and shall be delivered to him upon Completion of the Work.

Article 5: Separate Contracts

The Owner may award other contracts in the vicinity of the Work which may proceed simultaneously with the execution of this Contract. The Contractor shall perform his Work so as not to cause interference with other contractors. The Contractor shall cooperate and coordinate its Work with the Owner's separate contractors, if any.

Article 6: Subcontractors

(ii) Prior to the execution and delivery of the Agreement, the successful Bidder shall submit to the Engineer for acceptance a list of names of Subcontractors and such other persons and organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for those portions of the Work. Prior to the execution and delivery of the Agreement, the Engineer shall notify the successful Bidder in writing, if the Engineer, after due investigation, has reasonable objection to any Subcontractor, person or organization on such list. The Owner shall decide, based on the Engineer's objection, if the Agreement shall be executed with the existing list. The Contractor has the option to substitute another Subcontractor, person, or organization to satisfy the Engineer's objection without additional compensation. Failure to notify the Contractor prior to the execution and delivery of the Agreement shall constitute an acceptance of such Subcontractor, person or organization. Acceptance of any such Subcontractor, person or organization shall not constitute a waiver of any right of the Engineer to reject defective Work, material or equipment not in conformance with the requirements of the Contract Documents.

(jj) The Contractor shall be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any Contractual relationship between any Subcontractor and the Owner or the Engineer to pay or to see to the payment of any monies due any Subcontractor, sub-Subcontractor or supplier, except as may otherwise be required by law.

(kk) The Contractor agrees to specifically bind every Subcontractor to all of the applicable terms and conditions of the Contract Documents. Every Subcontractor, by undertaking to perform any of the Work, shall there by automatically be deemed to be bound by such terms and conditions.

Article 7: Materials, Equipment and Labor; Or Equal Clause

(ll) The Contractor shall provide and pay for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities, services, and incidentals necessary for the execution and completion of the Work.

(mm) All materials and equipment shall be new, except where specifically noted in the Contract Documents or where reuse is allowed and the conditions of reuse. If required by the Contract Documents or the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment to be furnished.

(nn) Wherever in these Contract Documents a particular brand, make of material, device or equipment is shown or specified, such brand, make of material, device or equipment shall be regarded as a standard of quality, performance and serviceability. Where such items are specified, unless otherwise noted, this shall not be interpreted to preclude the furnishing of items other than those specified where the quality, use and serviceability of the substitute is adjudged by the Engineer to be the equal or better than the standard.

(oo) All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processors, except as otherwise specifically provided in the Contract Documents.

Article 8: Patent Fees and Royalties

The Contractor shall pay all license fees and royalties and assume all costs incident to the use of any invention, design, process or device which is the subject of a patent rights or copyrights held by others. The Contractor shall indemnify and hold harmless the Owner and the Engineer and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorney's fees) arising out of any infringement of such rights during or after completions of the Work, and shall defend all such claims or allegations, even if meritless, in connections with any infringement of such rights.

Article 9: Permits, Laws and Regulations

(pp) The Contractor shall secure and pay for all applicable permits and licenses in connection with the Work.

(qq) The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the Specifications or Drawings are at variance therewith, he shall give the Engineer prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he shall bear all costs arising therefrom, including but not limited to attorneys' fees and costs.

Article 10: Availability of Lands; Physical and Subsurface Conditions

The Owner shall provide, as indicated in the Contract Documents and not later than the date when needed by the Contractor, the lands upon which the Work is to be done, rights-of-way for access thereto, and such other lands which are designated for the use of the Contractor. Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified in the Contract Documents. If the Contractor believes that any delay in the Owner's furnishing

these lands or providing such easements entitles him to an extension of the Contract Time, he may make a claim therefore as provided hereafter. The Contractor shall provide and pay for all additional land and access thereto that may be required for temporary storage of materials and equipment.

Article 11: Engineer's Control

(rr) In the performance of the Work, the Contractor shall abide by all orders, directions and requirements of the Engineer and shall perform all Work to the satisfaction of the Engineer, consistent with the requirements of the Contract Documents. The Engineer shall determine the amount, quality, acceptability and fitness of all parts of the Work, shall interpret the Contract Documents and Change Orders and shall decide all other questions in connection with the Work.

(ss) The enumeration herein or elsewhere in the Contract Documents of particular instances in which the opinion, judgment, discretion or determination of the Engineer shall control or in which Work shall be performed to his satisfaction or subject to his approval or inspection, shall not imply that only matters similar to those enumerated shall be so governed and performed, but without exception all the Work shall be so governed and so performed.

(tt) The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Engineer and shall not proceed with that portion of the Work without further written instructions from the Engineer. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

(uu) If the Contract Documents refer to particular construction means, methods, techniques, sequences or procedures, or indicate or imply that such are to be used in the Work, such mention is intended only to indicate that the operations of the Contractor shall be such as to produce at least the quality of Work implied by the operations described, but that the actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the responsibility of the Contractor. The Contractor shall notify the Engineer for informational purposes only of the actual construction means, methods, techniques, sequences or procedures, which the Contractor intends to employ on the Work, if those differ from those mentioned in the Contract Documents.

Article 12: Authority and Duties of Inspectors

Inspectors employed by the Owner or the Engineer shall be authorized to inspect all Work done and material furnished. Such inspection may extend to all or any part of the Work, and to the preparation or manufacture of the materials to be used. In case of any dispute arising between the Contractor and the Inspector as to materials furnished or the manner of performing the Work, the Inspector shall have authority to reject material or

suspend the Work until the question at issue can be referred to and decided by the Engineer. The Inspector shall not be authorized to revoke, alter, enlarge, relax or release any requirements of the Contract Documents, nor to approve or to accept any portion of the Work nor issue instructions contrary to the Contract Documents. The Inspector shall in no case act as foreman or perform other duties for the Contractor, or interfere with the management of the Work by the Contractor. Any advice which the Inspector may give the Contractor shall in no circumstance be construed as binding the Engineer or Owner in any way nor releasing the Contractor from fulfillment of the terms of the Contract.

Article 13: Tests and Inspections

(vv) If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor shall give the Engineer timely notice of readiness therefore. The Contractor shall furnish the Engineer the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. The cost of all such inspections, tests and approvals shall be borne by the Contractor unless otherwise provided.

(ww) Any Work which fails to meet the requirements of any such test, inspection or approval and any Work which meets the requirements of any such test or approval, but does not meet the requirements of the Contract Documents shall be considered defective. Such defective Work may be rejected, corrected or accepted as may be determined by the Engineer.

(xx) Neither observations by the Engineer or the Inspector nor inspections, tests or approvals by other persons shall relieve the Contractor from his obligation to perform the Work in accordance with the requirements of the Contract Documents.

Article 14: Contractor's Supervision and Superintendence

(yy) The Contractor shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences and procedures. In accordance with Article 3, before undertaking the Work he shall carefully study and compare the Contract Documents and check and verify all figures shown thereon. He shall at once report in writing to the Engineer any conflict, error or discrepancy which he may discover, the Contractor shall be responsible to see that the Work complies with the Contract Documents.

(zz) The Contractor shall keep on the Work Site, at all times during its progress, a full-time resident superintendent satisfactory to the Engineer and Owner. The superintendent shall not be replaced without the consent of the Engineer except under extraordinary circumstances. The Superintendent shall be the Contractor's representative at the Site and shall have authority to act on behalf of the Contractor. All Communications given to the superintendent shall be as binding as if given to the Contractor.

(aaa) The Engineer or Owner shall not be responsible for the acts or omissions of the Contractor, or any Subcontractors, or any of his or their agents or employees, or any other persons performing any of the Work.

Article 15: Safety and Protection; Emergencies

(a) The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work as may be required by

applicable law, industry standard, or local practice. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

3. All employees on the Work site and other persons who maybe affected thereby.

4. All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

5. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities.

(b) No materials or other obstruction shall be placed within fifteen (15) feet of any fire hydrant, which at all times must be readily accessible to the fire department.

(bbb) The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. All damage, injury or loss to any property referred to in the above paragraphs caused, directly or indirectly, in whole or in part by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor.

(ccc) In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, is obligated to act, at his discretion, to prevent threatened damage, any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes involved, provided such action is not the result of the fault or negligence, in whole or in part, of the Contractor, a Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

Article 16: Access to the Work; Uncovering Finished Work

(ddd) The Engineer and his representatives shall, at all times, have access to the Work. The Contractor shall provide proper facilities for such access and observation of the Work and also for any inspection, or testing thereof by others.

(eee) If any Work is covered contrary to the instruction of the Engineer, it must, if requested by the Engineer, be uncovered for his observation and replaced at the Contractor's expense.

(fff) If any Work has been covered which the Engineer has not specifically requested to observe prior to its being covered, or if the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective or does not meet the requirements of the Contract Documents, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate Change Order shall be issued deducting all such costs from the Contract Price. If, however, such Work is found to be non-defective and meets the requirements of the Contract Documents, the Contractor shall be allowed an

increase in the Contract Price or extension of the Contract Time directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefore as provided hereafter.

Article 17: Change in the Work

(ggg) Without invalidating the Agreement, the Owner may, at any time or from time to time, order additions, deletions or revisions in the Work; these shall be authorized by Change Orders. Upon receipt of a Change Order, the Contractor shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment may be made as provided hereafter.

(hhh) The Engineer may authorize minor changes or alterations in the Work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a field order ("Field Order"). If the Contractor believes that any minor change or alteration authorized by the Engineer entitles him to an increase in the Contract Price, he may make a claim therefore as provided hereafter.

(iii) Additional Work performed by the Contractor without authorization of a Change Order shall not entitle him to an increase in the Contract Price or an extension of the Contract Time, except in the case of an emergency as provided in herein.

(jjj) It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the Work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor will furnish proof of such adjustment to the Owner.

(kkk) A Construction Change Directive is a written order prepared by the Engineer and signed by the Owner and Engineer, directing the Contractor to proceed with certain Work deemed by the Owner and Engineer to be within the scope of the Contract or a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions. The Contract Sum and Contract Time may be adjusted accordingly.

(lll) A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order or as a directive to the Contractor to proceed with work deemed by the Owner and Engineer to be within the scope of the Contractor's Work, which the Contractor disputes

Article 18: Change Orders

(a) The value of any Work covered by a Change Order shall be determined in one of the following ways:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.

2. By mutual acceptance of a lump sum.

3. By cost and mutually acceptable fixed amount for overhead and profit.

4. If none of the above methods is agreed upon, the value shall be determined by the Engineer on the basis of costs and a percentage for overheard and profit. Costs shall only include labor (payroll, payroll taxes, fringe benefits, workmen's compensation, etc.), materials, equipment, and other incidentals directly related to the Work involved. The maximum percentage which shall be allowed for the Contractor's combined overhead and profit shall be as follows:

a. For all such Work done by his own organization, the Contractor may add up to ten percent (10%) of his actual net increase in costs, and

b. For all such Work done by Subcontractors, each Subcontractor may add up to ten percent (10%) of his actual net increase in costs form combined overhead and profit and the Contractor may add up to five percent (5%) of the Subcontractor's total for his combined overhead and profit; provided that no overhead or profit shall be allowed on costs incurred in connection with premiums for public liability insurance or otherwise special insurance directly related to such Work.

In each case, the Contractor will submit in form prescribed by the Engineer an itemized cost breakdown together with supporting data.

5. The amount of credit to be allowed by the Contractor to the Owner for any such change which results in a net decrease in cost will be the amount of the actual net decrease as determined by the Engineer. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase, if any.

Article 19: Change of the Contract Time

(mmm) The Contract Time may only be changed by a Change Order. If the Contractor is entitled by the Contract Documents to make a claim for an extension in the Contract Time, his claim shall be in writing delivered to the Engineer within ten (10) days of the occurrence of the event giving rise to the claim. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

(nnn) The Contract Time may be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a claim therefore as provided in paragraph above. Such delays shall include, but not be restricted to, acts or neglect by any other Contractor employed by the Owner, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God or the public enemy.

(ooo) All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this article shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party.

(ppp) No Damage for Delay. In all events, the Contractor shall have no separate claim for damages or costs of any kind resulting from a delay in the Work as demonstrated by the Contractor's construction schedule, regardless of whether all or part of such delay may be in any way attributable to the acts, the failure to act, or the omissions of the Owner, the Owner's agents or representatives or independent contractors, the Owner's consultants, if any, the Engineer or the Engineer's consultants. The Contractor agrees that its sole remedy for such delay shall be an extension of time, which may be granted or denied in accordance with the terms of this Agreement.

(qqq) Waiver of Impact Claims. In all events, the Contractor waives all forms of impact claims including but not limited to efficiency, loss of productivity, trade stacking,

disruption, re-sequencing, and the like regardless of whether all or part of such impact may be in any way attributable to the acts, the failure to act, or the omissions of the Owner, the Owner's agents or representatives or independent contractors, the Owner's consultants, if any, the Engineer or the Engineer's consultants.

(g) The Contractor shall include similar No Damage for Delay and No Impact Claim provisions in the agreements the Contractor executes with its Subcontractors, suppliers and other persons or entities that the Contractor employs to perform the Work.

(rrr) The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this Contract. This waiver includes damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit. This waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with the Contract Documents.

Article 20: Warranty and Guarantee; Correction, Removal or Acceptance of Defective Work

(sss) The Contractor warrants and guarantees to the Owner and the Engineer that all materials and equipment shall be new unless otherwise specified and that all Work will be of good quality and free from faults or defects and in accordance with the requirements of the Contract Documents and of the inspections, tests or approvals referred to in Article 13: Tests and Inspections. All unsatisfactory Work, all faulty or defective Work and all Work not conforming to the requirements of the Contract Documents or of such inspections, tests or approvals shall be considered defective. Prompt notice of all defects shall be given to the Contractor. All defective Work, whether or not in place, may be rejected.

(ttt) If required by the Engineer prior to the issuance of the certificate of completion, the Contractor shall promptly, without cost to the Owner and as required by the Engineer, either correct any defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Engineer, remove it from the site and replace it with non-defective Work or remove and replace such rejected Work within a reasonable time, all as required by written notice from the Engineer, the Owner may have deficiency corrected or the rejected Work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services shall be paid by the Contractor, and an appropriate Change Order shall be issued deducting all such costs from the Contract Price. The Contractor shall also bear the expenses of making good all work of others destroyed or damaged by his correction, removal or replacement of his defective Work.

(uuu) If, after the approval of final payment and prior to the expiration of one (1) year after the date of completion, any Work is found to be defective the Contractor shall, promptly without cost to the Owner and in accordance with the Owner's written instructions, either correct such defective Work, or, if it has been rejected by the Owner, remove it from the site and replace it with non-defective Work. If the Contractor does not promptly comply with the terms of such instructions, the Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including Compensation for additional professional services, will be paid by the Contractor and/or deducted from monies owed the Contractor.

Article 21: Applications for Progress Payments

(vvv) At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor shall submit to the Engineer for review the Application for Payment filled out and signed by the Contractor covering the Work completed as of the date of the Application and supported by such data as the Engineer may reasonably require. There shall be no payment for materials stored on or off the site. The progress payment request shall be subject to a five percent (5%) retainage which shall be held by the Owner until all defective work and all punch list items have been addressed to the full satisfaction of the Engineer and the Town. The retainage may be held beyond the application for Final Payment if there is any outstanding defective work that needs to be corrected and/or punch list items that need to be addressed; after which time all outstanding defective work has been corrected and all punch list items have been addressed to the full satisfaction of the Engineer and the Town; the retainage can be released. Retainage can be reduced, after the application for Final Payment has been made, to the value of the outstanding defective work that needs to be corrected plus the value of punch list items that need to be addressed.

(www) The Contractor warrants and guarantees that title to all Work, materials and equipment covered by an Application for Payment, whether incorporated in the Project or not, shall have passed to the Owner prior to the making of the Application for Payment, free and clear of all liens, claims, security interests and encumbrances; and that no Work, materials or equipment covered by an Applications for Payment shall have been acquired by the Contractor or by any other person performing the Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person. Each progress payment request shall be accompanied by Lien Waivers in a form satisfactory to the Owner's legal counsel. No progress payment shall be processed by the Engineer for payment without fully executed lien and claim waivers from the Contractor, material suppliers and Subcontractors.

(xxx) The Engineer shall, within thirty (30) days after receipt of each Application for Payment, either indicate in writing his approval of payment and present the Application to the Owner, or return the Application to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the Application.

(a) The Owner shall, within thirty (30) days of presentation of an approved Application for Payment by the Engineer, pay the Contractor the amount approved by the Engineer.

(b) The Contractor shall pay its Subcontractor(s) and suppliers in accordance with applicable Connecticut law and shall cause its Subcontractor(s) to pay their Subcontractor(s) in accordance with applicable Connecticut law.

Article 22: Certificates of Completion and Final Payment

(yyy) Upon written notice from the Contractor that the Project is complete, the Engineer shall make a final inspection with the Owner and the Contractor and shall notify the Contractor in writing of any particulars in which this inspection reveals that the Work is defective and/or not completed. The Contractor shall immediately make such corrections and perform such work as are necessary to remedy such defects and/or complete the project.

(zzz) After the Contractor has completed any such corrections and finished the contract work to the full satisfaction of the Engineer and delivered all maintenance and operating

instructions, schedules, guarantees, bonds, certificated of inspection, lien and claim waivers from itself, Subcontractor(s) and material suppliers, and other documents, all as required by the Contract Documents; the Engineer shall issue a certificate of completion and the Contractor may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by such supporting data as the Engineer may require, together with complete and legally effective releases or waivers (satisfactory to the Owner) of all liens and claims arising out of the Work, including but not limited to all labor and services performed and the material and equipment furnished thereunder. In lieu thereof and as approved by the Owner, the Contractor may furnish receipts of releases in full; an affidavit of the Contractor that the releases which a lien or claim could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or supplier fails to furnish a release or receipt in full, the Contractor may furnish a bond satisfactory to the Owner to indemnify and defend it against any lien or claim.

(c) If, on the basis of his observation and review of the Work during construction, his final inspection and his review of the final Application for Payment, all as required by the Contract Documents, the Engineer is satisfied that the Work has been completed and the Contractor has fulfilled all of his obligations under the Contract Documents, he will, within thirty (30) days after receipt of the final Application for Payment, indicate in writing his approval of payment and present the Application to the Owner for payment. Otherwise, he will return the Application to the Contractor, indicating in writing his reasons for refusing to approval final payment, in which case the Contractor will make the necessary corrections and resubmit the Application for Payment.

(aaaa) Final payment shall constitute one hundred percent (100%) of the final Contract amount. A Maintenance Bond in the amount of one hundred percent (100%) of the Contract Cost shall be provided prior to final payment. The Owner shall, within thirty (30) days of presentation to him of an approved final Application for Payment, pay the Contractor the amount approved by the Engineer.

Article 23: Waivers of Claims and Continuing Obligations

(bbbb) The Contractor's obligation to perform the Work and complete the Project in accordance with the Contract Documents shall be absolute. Neither approval of any progress or final payment by the Engineer, nor any payment by the Owner to the Contractor under the Contract Documents, nor any use or occupancy of the Project or any part thereof by the Owner, nor any act of acceptance by the Owner nor any failure to do so, nor any correction of faulty or defective Work by the Owner shall constitute an acceptance of Work not in accordance with the Contract Documents.

(cccc) Pending final resolution of a claim, except as otherwise mutually agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments, which are not the subject of a good faith dispute, in accordance with the Contract Documents.

(dddd) The making and acceptance of final payment shall constitute a waiver of all claims by the Contractor against the Owner other than those previously made in writing and still unsettled.

Article 24: Indemnification

(eeee) To the fullest extent permitted by law the Contractor shall defend, indemnify and hold harmless the Owner, the Engineer, the Owner's consultant(s), if any, and their respective officers, directors, owners, agents, members, employees and independent contractors of any of them from and against all allegations, even if meritless, claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Article.

(ffff) Further, to the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, the Engineer and the Owner's consultant(s) and their respective officers, directors, owners, agents, members, employees and independent contractors, from and against all allegations, even if meritless, claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from any breach or failure of the Contractor to comply with the terms and conditions of the Contract Documents but only to the extent caused by the acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Article.

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

(a.) All defense, indemnity and hold harmless provisions set forth in this Contract shall survive termination and/or cancellation and/or full performance of the Contract.

Article 25: Cleaning Up

The Contractor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work, and at the completion of each day of the Work shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and passable. The Contractor's failure to keep the site free from waste, rubbish and debris on a daily basis shall entitle the Owner to clean up said waste, rubbish and debris and charge the costs of the same to the Contractor without notice and/or deduct said costs from monies owed to the Contractor.

Article 26: Owner's Right to Stop or Suspend Work

(a) The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

(b) The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension or interruption. No adjustment shall be made to the extent

(c) That performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is wholly or partially responsible; or

(d) That an equitable adjustment is made or denied under another provision of the Contract.

(e) The Contractor shall resume the Work on the date so fixed by the Owner.

Article 27: Owner's Right to Terminate

The Owner may terminate or abandon the Project for any one or more of the following reasons:

(a) If the Contractor is adjudged as a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to his Subcontractor(s) or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction, or if he disregards the authority of the Engineer or Owner, or if he otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and his surety seven (7) days written notice, terminate the services of the Contractor and take possession of the Work and of all machinery thereon owned by the Contractor, and finish the Work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Work, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Owner on demand including but not limited to attorneys' fees and any other associated costs. Such other associated costs will be determined by the Owner.

(c) Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any rights of the Owner against the Contractor then existing or which may thereafter accrue.

(d) Upon seven (7) days written notice to the Contractor and the Engineer, the Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the project and terminate the Agreement for the Owner's convenience. In such case, the Contractor shall be paid for all Work actually executed and reasonable expenses sustained by reason of such termination. The Engineer shall reasonably determine the amount of monies due the Contractor. Such payment shall not include any overhead or profit on Work not executed. In all events, the Contractor

waives any and all claims for damages of any kind or nature including but not limited to claims for overhead and profit on Work not executed.

(d) In the event the Owner is adjudged to have wrongfully terminated the Agreement, then such termination shall be converted into a termination for convenience and the Contractor shall be compensated as provided in Paragraph (c) above.

Article 28: Contractor's Right to Stop Work or Terminate

(e) If, through no act or fault, in whole or in part, of the Contractor or anyone for whom it is directly or indirectly liable, the Work is suspended for a period of more than ninety (90) days by the Owner or under an order of court or other public authority, or the Engineer fails to act on any Application for Payment within sixty (60) days after it is submitted, or the Owner fails to pay the Contractor any sum approved by the Engineer within sixty (60) days of its approval and presentation, then the Contractor may, upon seven (7) days written notice to the Owner and the Engineer, terminate the Agreement and recover from the Owner payment for all Work executed. The Engineer shall reasonably determine the amount of monies due the Contractor. Such payment shall not include any overhead or profit on Work not executed. In all events, the Contractor waives any and all claims for damages of any kind or nature including but not limited to claims for overhead and profit on Work not executed.
Instead of terminating the Agreement, if the Engineer has failed to act on an approved [by the Engineer] Application for Payment or the Owner has failed to make any approved payment [by the Engineer and Owner] as aforesaid, the Contractor may upon seven (7) days' notice to the Owner stop the Work until he has been paid all approved amounts then due. Contractor cannot stop work for lack of payment if said payment was not made for reason.

Article Provisions Required by Law Deemed Inserted
Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted or is not correctly inserted, then upon the application of either the Owner or the Contractor, the Contract shall forthwith be physically amended to make such insertion.

Article 30: Contract Security
The Contractor shall furnish surety bonds acceptable to the Owner in an amount at least equal to one hundred percent (100%) of the Contract Price as security for the faithful performance of this Contract and for payment of all persons performing labor under this Contract and furnishing materials in connection with this Contract. The surety on such bond shall be a duly authorized surety company, satisfactory to the Owner and authorized to do business in the State of Connecticut.

Article 31: Time for Completion and Liquidated Damages
It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the Contract Documents (as outlined in the Instruction to Bidders section of this Contract) for the Work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it further mutually understood and agreed that the Work embraced in this Contract shall be commenced not more than ten (10) calendar days from the date of written Notice To Begin Work or Notice to Proceed or issuance of a Work Order.

The Contractor agrees that said Work shall be pursued regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the Work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as part consideration for the awarding of this Contract, to pay the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, the said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates. It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due:

(a) To any preference, priority or allocation order duly issued by the State or Federal Government;

(b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, act of God, or the public enemy,, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes; and

(c) To any delays of Subcontractor(s) or supplies occasioned by any of the causes specified in subsections (a) and (b) of this article.

Article 32: Sanitary Facilities

Contractor shall provide and maintain such sanitary accommodations for use of his employees and those of his Subcontractors as may be necessary to comply with requirements and regulations of local and state departments of health and as directed by Engineer.

Article 33: Nondiscrimination Clause

Contractor agrees to comply with all provisions of the Civil Rights Act of 1964, the Equal Opportunity Act of 1972, Executive Orders 11246, 11375, 11478, and if applicable the Connecticut Fair Employment Practice Law and any and all similar state or federal legislation, and any amendments thereof.

Article 34: Wage Scale Provisions

Contractor agrees to comply with all State/Federal Wage Scale Provisions and the Wage and Payroll Section of this Contract in accordance with Conn. Gen. Stat. Section 31-53(g) if applicable based on the Contractor's submitted total bid price for the project work included under this Contract.

Article 35: Work by Others

The Contractor agrees that the Owner may permit other persons, firms, corporations or entities to utilize publicly owned property at the site of the Work and that such permission(s) shall not affect this Agreement.

Article 36: Mediation of Disagreements

In case of any dispute between the Owner and the Contractor or other party making claims in relation to this Contract concerning the respective rights and liabilities of the parties thereunder, which cannot be resolved within thirty (30) days by mutual agreement of the parties may be referred to the American Arbitration Association for Non-Binding Mediation by either party. The costs of such Mediation shall be borne equally by each party involved in the Mediation. Only in the event of failure to resolve the dispute by Mediation shall suit be instituted under this Contract; provided however, that any party may institute suit to preserve any claims as may be required by law.

Article 37: Applicable Law

This Contract is to be governed by and construed in accordance with the laws of the State of Connecticut. Any suit brought against a party to this Contract shall be brought exclusively in the Connecticut Superior Court of the Hartford Judicial District.

Article 38: Alteration and Amendments

This Contract may be altered, amended or modified only in writing by the Owner and the Contractor.

Article 39: Notice

Any notice under this Contract shall be in writing and shall be sent by Registered or Certified Mail, with Return Receipt, to the Owner c/o its Chief Administrative Officer or the Contractor, each at the last address as designated by each party in writing.

Article 40: Shop Drawings and Samples

(a) If required by the Engineer and/or the contract documents contained herein, after checking and verifying all field measurements, the Contractor shall submit to the Engineer for approval, in accordance with the accepted schedule of Shop Drawing submissions, five (5) copies (or at the Engineer's option, one reproducible copy) of all Shop Drawings and other submittals as may be required by the Contract Documents and/or as ordered by the Engineer, which shall have been checked by and stamped with the approval of the Contractor and identified as the Engineer may require. The data on Shop Drawings and other submittals shall be complete with respect to dimensions, design criteria, materials of construction and the like to enable the Engineer to review the information as required.

(b) The Contractor shall also submit to the Engineer for approval, with such promptness as to cause no delay in the Work, all samples shall have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent catalog numbers, and the use for which intended.

(c) At the time of each submission, the Contractor shall, in writing, call the Engineer's attention to any deviations that the Shop Drawing(s) or sample may have from the requirements of the Contract Documents.

(d) The Engineer shall review, with reasonable promptness, Shop Drawing(s) and samples, but his review shall be only for conformance with design concept of the Project

and for compliance with the information given in the Contract Documents. The review of separate items as such shall not indicate review of the assembly in which the item functions. The Contractor shall make any corrections required by the Engineer and shall return the required number of corrected copies of the Shop Drawings and resubmit new samples until reviewed and accepted. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by the Engineer on previous submissions.

(e) No Work requiring a Shop Drawing or sample submission shall commence until the submission has been reviewed by the Engineer.

(e) The Engineer's review of the Shop Drawings or samples shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents, unless the Contractor has in writing called the Engineer's attention to such deviations at the time of submission and the Engineer has given written approval to the specific deviation, nor shall any approval by the Engineer relieve the Contractor from the responsibility for errors or omissions in the Shop Drawings.

Article 41: Maintenance Bond

The Contractor shall be required to furnish the Owner a Maintenance Bond in the amount of one hundred (100%) percent of the final cost of the work prior to Final Payment. This Maintenance Bond shall assure the satisfactory condition of the required Work under the Contract for a period of not less than one (1) year after the acceptance of the Work by the Owner. The Surety for the Bond shall meet the same criteria as for the Performance Bond and the Labor and Materials Payment Bond.

Article 42: Progress Prints and As Built Drawings

At the completion of the Work and if required by the Contract Documents and/or by the Engineer, and as an express condition precedent to final payment, the Contractor shall submit to the owner and Engineer an as-built of the Work completed under the this Contract.

Article 43: Electrical Energy

The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light required for the proper completion of this Contract during its entire progress. The Contractor shall provide, obtain permits for, and pay for all temporary wiring, switches, connections, and meters. There shall be sufficient artificial light, by means of electricity, so that all Work may be done in a workmanlike manner, when there is not sufficient daylight. Sufficient temporary power outlets shall be furnished to enable the various trades to use normal electric power tools.

Article 44: Standard Specifications

All Contract Specifications, Special Provisions, and any specification documents [e.g. State of Connecticut Department of Transportation FORM 817] referenced in these contract documents shall be considered part of this Contract. The specifications for any materials referred to in this contract shall comply with all the pertinent material specifications of the State of Connecticut Department of Transportation FORM 817 for said material [or similar material in Form 817]. All construction procedures for any work referred to in this contract shall comply with all the pertinent construction methods of the State of Connecticut Department of Transportation FORM 817 for said work [or similar work in Form 817]. Note, payment for any materials and work shall be at the respective various unit prices or lump sum prices listed in the Contract Proposal and shall be inclusive of all work and materials related thereto.

Article 45: Call Before You Dig Requirements

Prior to opening an excavation, effort shall be made to determine whether underground installations, i.e., sewer, water, fuel, electric lines, etc. will be encountered and, if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined by careful probing or hand digging, and when it is uncovered, proper support shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation.

"CALL BEFORE YOU DIG," toll free, statewide, 1-800-922-4455 at least 24 hours in advance of performing any excavation and/or as may be required.

Article 46: Protection Of The Work

The Contractor shall protect all work done under this contract, and all work done by the Owner's separate contractors within the limits of this Contract during the progress of the Work and until completion, from injury by reason of any work under this Contract, or by reason of any negligence on its part, or by reason of weather conditions. The method to be employed for protection shall be at the Contractor's discretion, but shall be subject to the approval of the Engineer, who may order the work or any portion of it suspended when he considers conditions to be not favorable for first-class work.

The Contractor shall protect all Work; bituminous pavement, concrete walk, grass areas, etc., from all traffic and use until it is suitable for use or until completion of the Contract.

Article 47: Dust Control and Cleanup

Upon suspension or completion of the Work or of any portion thereof, the Contractor shall remove all materials, equipment and rubbish, and shall leave the premises in a neat and orderly condition. The premises shall, during the progress of the work, be kept clean, presentable and satisfactory to the Engineer, and shall be so left at the completion of the Contract. As the work progresses, all streets shall be thoroughly cleaned of all rubbish, excess earth, rock, and other debris. The Contractor shall take necessary precautions to prevent and avoid dust and to keep the streets clean each day, whether a normal work day or not. All cleanup operations shall be accomplished to the satisfaction of the Engineer. The cost of any work associated with any required dust control and/or cleanup for the work under this project will be considered included in the base unit prices and/or lump sum prices for each item in the bid proposal and there will be no separate payment for such work performed to complete this project.

Article 48: Construction Materials

Construction materials on the site shall be limited in quantity and place occupying area so as to not hinder and block the use of the roadway nor any facilities.

No advance payment will be made to the Contractor for construction materials purchased in advance and stored by the Contractor. All materials will be paid for each item complete and accepted in place according to the Contract Price or applicable unit prices.

Article 49: Construction Staking, Line, and Grade

Any survey work required for the proper construction of the various components, appurtenances, etc. associated with the project and work included in this Contract; shall be the Contractor's responsibility to coordinate and have performed. The Contractor

shall complete all work to within 1/4 inch of line and grade as indicated on the Contract Plans and/or as established by the Engineer, except where otherwise specified. The Contractors surveyor shall be responsible for supplying line and grade at least 48 hours prior to beginning any work that may require line and grade.

Unless the Bid documents include an item for construction surveying and staking; the cost of any work associated with any required construction surveying and staking for the work under this project will be considered included in the base unit prices and/or lump sum prices for each item in the bid proposal and there will be no separate payment for such work performed to complete this project.

Article 50: Work Procedure

When paving, crack filling, pipe work, etc. is part of this Contract, the Contractor shall start and complete all said work on one section of the street or road at a time prior to proceeding with other sections unless otherwise authorized by the Town. The Contractor shall schedule its operations so that vehicular traffic will not be unduly hindered.

The Contractor shall not perform work [paving, crack filling, pipe work, etc.] on more than two (2) streets at a time, unless approved by the Engineer in writing. The Contractor shall notify property owners, occupants, tenants, etc.; 48 hours in advance when access to private property (e.g. driveways, sidewalks, etc.) is to be hindered or denied. .

Access to local properties and businesses shall be maintained at all times except when actual Work is being done in front of a driveway or sidewalk to a property and except for the normal cooling period after the bituminous concrete has been laid and/or curing when Portland cement concrete has been placed.

Article 51: Prompt Completion of Work

After an excavation or other work [paving, crack filling, pipe work, etc.] is commenced, the Contractor shall prosecute the Work with diligence and on a continuous uninterrupted basis and shall promptly complete such Work and restore the street to its original condition or as near as may be, so as not to obstruct the street or travel thereon more than is reasonably necessary.

Article 52: Work Interruptions

There may be some occasions where utility companies will be involved in the relocation or adjustment of their existing facilities. In such event, the Contractor shall work in another location until the utility completes its work. No additional compensation will be made for delays or inconvenience sustained by the Contractor due to interference by the utility companies.

Article 53: Temporary Suspension of Work

The Engineer or Owner shall have the authority to suspend the work wholly or in part, for such period or periods as he considers necessary in the best interest of the Town, or in the interest of public necessity, convenience or safety as provided in this Agreement.

If it should become necessary to stop work for an identified period, the Contractor shall store all materials and equipment in such manner that they will not obstruct or impede the traveling public unnecessarily nor allow the material to become damaged in anyway; and

he shall take every precaution to prevent damage to the work already completed, and to erect temporary structures where necessary.

The Contractor shall maintain the roadway and other project areas in safe condition for travel and shall maintain all barricades, signs and lights during the period of project suspension, construction and/or disturbance.

Unless the Bid documents include an item(s) for maintenance and protection of traffic; the cost of any work associated with any required maintenance and protection of traffic including but not limited to barricades, signs, lights, temporary travel lanes, temporary pavement, signals, etc. as required and/or as ordered by the engineer for the same execution of the work under this project will be considered included in the base unit prices and/or lump sum prices for each item in the bid proposal and there will be no separate payment for such work performed to complete this project.

Article 54: Manholes and Utility Cuts

All manhole frames and covers, gate boxes and similar structures in the area of the Work shall be reset to the proper line and grade by the Contractor. Repairs of all cuts in the pavement base will be the responsibility of the Contractor. The Contractor shall cooperate with all utility owners to facilitate this Work.

Article 55: Signs and Traffic and/or Pedestrian Detours

When necessary, the Owner or the Engineer will determine all traffic and/or pedestrian detours. The Contractor shall cooperate in placing the signs where required and/or as ordered by the Engineer.

The Contractor shall place and maintain barricades, fencing, as needed and/or as ordered by the Owner or the Engineer to protect areas of the construction site. The Contractor shall place barricades on all side streets at the next intersection away from the street or roadway section where construction [paving, crack filling, pipe work, etc.] is taking place or any other construction work area involved. The Contractor shall place barricades where needed for "Detour", “Local Traffic Only”, “Local Pedestrian Traffic Only” and other such signs as may be required to prevent entrance into the designated construction area(s). Any barricades remaining overnight and on weekends must have lights and reflectors when such are placed near active travel ways [pedestrian or vehicular].

The Contractor shall furnish all warning signs as shown on the Contract Documents as well as any and all additional barricades, traffic drums, detour signs and the like, including illumination of same as well as any obstacles in the roadway, using battery powered flashers as directed by the ENGINEER or applicable law or applicable standards. All signs associated with roadway construction [paving, crack filling, pipe work, etc.] and/or pedestrian travel way construction shall be in accordance with the Manual of Uniform Traffic Control Devices for Streets and Highways as published by the U.S. Department of Transportation, Federal Highway Administration, latest issue.

Unless the Bid documents include an item(s) for maintenance and protection of traffic; the cost of any work associated with any required maintenance and protection of traffic including but not limited to barricades, signs, lights, temporary travel lanes, temporary pavement, signals, etc. as required and/or as ordered by the engineer for the same execution of the work under this project will be considered included in the base unit

prices and/or lump sum prices for each item in the bid proposal and there will be no separate payment for such work performed to complete this project.

Article 56: Maintenance and Protection of Vehicular and Pedestrian Traffic

The Legal Traffic Authority for the Town of Canton shall prescribe all conditions for maintenance and protection of traffic for the Project. All work zones for construction under this contract shall be in conformance with the latest edition of the Manual of Uniform Traffic Control Devices [MUTCD] and/or as ordered by the Legal Traffic Authority for the Town of Canton. In general, if the excavation procedures expose utility frames for manholes, gate boxes, catch basins, etc. more than 2 inches, then a ramped section of processed stone or a temporary asphalt collar, or traffic control devices such as drums, cones and barricades shall be provided around these structures to prevent damage to vehicular traffic as required and/or as ordered by the Engineer.

Ramped sections and traffic control devices shall be to such dimensions and at such locations as shown on the Contract Documents or as directed by the Engineer or as required by applicable law or applicable standards.

Equipment and material left within the street lines overnight shall be protected by barricades or traffic drums equipped with flashing lights, as directed by the Engineer and in conformance with applicable laws and regulations and applicable standards, all at the Contractor's sole expense.

Unless the Bid documents include an item(s) for maintenance and protection of traffic; the cost of any work associated with any required maintenance and protection of traffic including but not limited to barricades, signs, lights, temporary travel lanes, temporary pavement, signals, etc. as required and/or as ordered by the engineer for the same execution of the work under this project will be considered included in the base unit prices and/or lump sum prices for each item in the bid proposal and there will be no separate payment for such work performed to complete this project.

Article 57: Noise

The Contractor shall conduct and carry out construction work in such a manner as to avoid unnecessary inconvenience and annoyance to the general public and occupants of neighboring property. During the hours of 3:00 p.m. and 7:00 a.m. he/she shall not use, except with the express written permission of the Engineer or in case of an emergency as herein otherwise provided, any tool, appliance or equipment producing noise of sufficient volume and or beyond limits established by local codes and ordinances so as to disturb the sleep or repose of occupants of the neighboring property.

Article 58: Operation of Equipment in Roadways

No equipment shall be operated with any metal surfaces, steel pads and cleats on backhoe outriggers and stabilizers and on crawler mounted equipment, etc., in direct contact with the surface of any pavement, curb or walk unless authorized by the Engineer. The Contractor shall use suitable wood, plywood or rubber blocks under outriggers and stabilizers or shall use rubber or fiber pads manufactured for the purpose and fastened to the steel pads. Suitable planking shall be used under crawler mounted equipment if required by the Town.

All pavements, curbs, walks, lawns, etc. damaged by the Contractor during its operations and not scheduled for repair or replacement under this Contract shall be repaired to the satisfaction of the Owner and Engineer at the Contractor's expense and without cost to the Owner.

Article 59: Clearance of Vital Structures

The construction work shall be performed and conducted so as not to interfere with access to fire hydrants, fire stations, fire escapes, water gates, underground vaults, catch basins and all other vital equipment as designated by the Owner.

The Contractor shall maintain all gutters free and unobstructed for the full depth of the adjacent curb and for at least one (1') foot in width from the face of such curb at the gutter line. Catch basins and/or yard drains shall be kept clear and serviceable.

The Contractor shall make provisions to take dispose of all surplus water, muck, silt, or other run-off pumped from excavations and shall be responsible for any damage resulting from its failure to so provide.

Article 60: Relocation and Protection of Utilities

Notice is hereby given that the Contractor must familiarize himself with the provision of Public Act No. 87-71 regarding its duties and responsibilities with respect to excavating, and discharging explosives on demolition in proximity to public utility underground facilities.

In case any said purpose pipe crossing or other encasement should be damaged, and for this purpose pipe crossing or other encasement or devices are to be considered as part of a substructure, they shall be repaired by the agency or person owning them and the expense of such repairs borne by the Contractor. The Contractor shall be responsible for any damage done to any public or private property by reason of the breaking of any water pipes, sewer, gas pipe, electric conduit or other utility. The Contractor shall inform itself as to the existence and location of all underground utilities; and shall arrange to have any such utilities marked out; prior to the commencement of any excavation and/or material removal, and protect the same against any damage.

Article 61: Protection of Adjoining Property

The Contractor shall at all times and at its own expense preserve and protect from injury any adjoining property by providing proper safeguards and taking other measures suitable for that purpose. The Contractor shall, at his own expense, shore up and protect all buildings, walls, fences or other property likely to be damaged during the progress of the construction work and shall be responsible for all damage to public or private property or highways resulting from its failure to properly protect and carry out said Work. The Contractor shall not disturb, cut or remove (even temporarily) any trees, bushes, shrubs or flowers on municipal or private property. Any of these items which have been disturbed, removed or cut by the Contractor shall be the sole responsibility of the Contractor; including replacement should any of the trees, bushes, shrubs or flowers die as a result of the Contractor's Work or operations.

Article 62: Excavation

Curbs, Walks, Roadway, Driveway Ramps/Aprons, and Trenches: The term excavation as used in this Contract for curbs and walks shall mean the removal to line and grade and the satisfactory disposal of all materials encountered, including the cutting and removal of tree roots, existing walk, driveways, curbs, gutters, pavement, and other obstructions encountered as necessary for the preparation of the subgrade for all proposed improvements. All such material excavated during the course of the work and not reusable shall become the property of the Contractor and it shall be his responsibility to legally dispose of the material.

Excavations of sidewalks, curbs, roadways, driveway ramps/aprons, and trenches shall be completely backfilled at the end of each workday once the new sidewalk, curb, roadway, driveway ramp/apron, trench construction components have obtained their proper strength for backfilling. Excavations for sidewalks, sidewalk ramps, curbs, roadway, driveway ramp/apron, trench construction components shall not remain open for more than 72 hours, at which time the Contractor shall complete the new construction [Portland cement concrete, bituminous concrete, structures, etc.] or prepare the excavated area so it is completely passable by vehicles and/or pedestrians at no extra cost to the Owner. The excavation for roadway, driveway, driveway ramp construction, and trenches must be completely backfilled and open for vehicular traffic at the end of each day. Trenches in paved roads may require a temporary bituminous concrete pavement surface at the end of each day. Trench segments that need to remain open for the next day's continuation of work may use steel plates to protect the trenches if approved by the Engineer but may require temporary bituminous concrete edge ramp paving if needed for vehicles and/or pedestrians to pass over.

Article 63: Trenches

The maximum length of open trench permissible at any time shall be as may be specified by the Owner and Engineer and no greater length shall be open for pavement removal, excavation, construction, backfilling, patching and all other operations without written permission of the Owner or Engineer. The Contractor shall be required to backfill and protect all trenches before the close of any working day. However, at the discretion of the Engineer, the Contractor may utilize steel plates measuring approximately 1" thick by 5' wide by 10' long to cover the open trench. Utilization of steel plates will generally be used only for overnight protection of trenches to allow completion of Work the following work day. Steel plates will not be used to keep trenches open more than one night. Trenches to be left open for more than one night shall be backfilled.

Article 64: Excavated Material

All material excavated from trenches or excavations shall be removed from the site of the Work except in rare cases where material is suitable for part of the backfill, however, permission must be granted by the Engineer prior to placement/use of any such material within the construction limits.

Article 65: Disposal of Excavated Material

Road grinding and excavated materials (radius granite curbs, catch basin frames, millings, etc.) that are reusable shall if, requested by the Engineer, be delivered to and unloaded at the location designated by the Owner, at no extra cost to the Owner. The

delivery will be coordinated by the Engineer. All other materials excavated that are not reusable and not wanted by the Owner shall become the property of the Contractor and it shall be his responsibility to legally dispose of the material.

Article 66: Use of Areas Behind Curb Line

The Contractor shall not store any material or park any equipment used on this Contract behind the curb line or in the road, without written permission from the Engineer. Should any area back of curb become damaged during construction, the Contractor shall be responsible for restoring the area to its original condition as directed by the Engineer.

Article 67: Insurance

The Contractor shall carry and keep in force during the term of this Agreement completed operations period insurance as more specifically described in the Contract Documents by a company or companies authorized to do business in Connecticut. The Company shall provide certificates of insurance and endorsements or insurance policies specifying such coverage and naming the Town and its officers, agents, employees and volunteers as additional insured prior to the start of the Work and on an annual basis. In the event of any conflict between the insurance requirements set forth below and insurance requirements set forth in other Contract Documents, the requirements in this Agreement shall control.

The Contractor shall provide the following coverages and minimum limits of insurance:

6) Worker's Compensation Insurance:
   Statutory Coverage

   Employer's Liability

   $1,000,000 each accident/$1,000,000 disease-policy limit/$1,000,000 disease each employee

7) Commercial General Liability:

   Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.

   Limits of Liability for Bodily Injury and Property Damage

   Each Occurrence $1,000,000

   Aggregate $2,000,000

8) Automobile Insurance:
   Including all owned, hired, borrowed and non-owned vehicles and pollution

   Limit of Liability for Bodily Injury and Property Damage:

   Per Accident $1,000,000

1) Umbrella

Each Occurrence	$5,000,000
Aggregate Limit	$5,000,000

The Contractor and the Contractor's subcontractors, if any, shall cause the commercial liability coverage required by the Contract Documents to include (1) the Town and its officers, agents, volunteers and employees, as additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Town and its officers, agents, volunteers and employees as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. The Contractor shall, before commencement of its Work, submit to the Town evidence of the aforementioned requirements from itself and its subcontractors, if any, in the form of an additional insured endorsement or insurance policy acceptable to the Town. Failure by the Contractor to provide the endorsements required in this section shall entitle the Town to withhold payment from the Contractor then due or to become due until such time as the endorsements or policies are provided. The insurance (both primary and umbrella coverages) of the Contractor and the Contractor's subcontractor's, if any, shall be primary to any insurance that may be available to the Town and its officers, agents, employees and volunteers and any insurance available to the Town and its officers, agents, employees and volunteers is secondary and non-contributory. The policies of insurance or endorsements as provided herein shall state that the insurance of the Contractor and the Contractor's subcontractor's, if any, (both primary and umbrella coverages) shall be primary to any insurance that may be available to the Town and its officers, agents, employees and volunteers and any insurance available to the Town and its officers, agents, employees and volunteers is secondary and non-contributory. The Contractor and the Contractor's subcontractor's, if any, shall cause their insurers to directly provide the Town with thirty (30) days advance notice of cancellation. The Contractor and the Contractor's subcontractor's, if any, shall cause their insurers to directly provide the Town with ten (10) days advance notice of cancellation for nonpayment. The insurance obligations provided herein shall survive the termination and/or cancellation and/or full performance of this Agreement

(a) The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
4. Claims for damages insured by usual personal injury liability coverage;
5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

6. Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
6. Claims for bodily injury or property damage arising out of completed operations; and
7. Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18 and elsewhere in the Contract Documents.
8. Products Liability and Completed Operations, Premises, Personal and Advertising Injury, and Independent Contractor.
9. Professional Liability to the extent the Contractor provides any professional services as may be required by the Contract Documents or required for the Contractor's means, methods and procedures.

(b) The insurance required by this Article shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverage's, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

(a) Certificates of insurance, policy endorsements and insurance policies acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies and endorsements required by this Article shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the time required by this Agreement.

(b) The Contractor and the Contractor's Subcontractors shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Engineer and the Engineer's consultants and the agents and employees of any of them as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner , the Engineer and the Engineer's consultants and the agents and employees of any of them as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. The Contractor shall, before commencement of its Work, submit to the Owner evidence of the aforementioned requirements from itself and its Subcontractors in the form of an ISO 20 10 11 85 additional insured endorsement or equivalent as determined by the Owner. Failure by the
Contractor to provide the Application for Payment then due or to become due

until such time as the endorsements are provided. The insurance of the Contractor and the Contractor's Subcontractor's (both primary and umbrella coverages) shall be primary to any insurance that may be available to the Owner, the Engineer and the Engineer's consultants and the agents and employees of any of them and any insurance available to the Owner, the Engineer and the Engineer's consultants and the agents and employees of any of them is secondary and non-contributory. The policies of insurance or endorsements as provided herein shall state that the insurance of the Contractor and the Contractor's Subcontractor(s) (both primary and umbrella coverages) shall be primary to any insurance that may be available to the Owner and any insurance available to the Owner is secondary and non-contributory. The

Contractor and the Contractor's Subcontractor's shall cause their insurers to directly provide the Owner with thirty (30) days advance notice of cancellation. The insurance obligations provided herein shall survive the termination and/or cancellation and/or full performance of this Agreement.

END OF GENERAL CONDITIONS

SPECIFICATIONS

(Note: Project Drawings with standard details and DOT Exhibit E located at end of Contract Document)

BID FORM

Date:_____

Pursuant to, and in compliance with, your "Requests for Proposals relating thereto, the undersigned,

_____
(Name of Company)

having visited the site and carefully examined the Bid documents **Dyer Softball Field Relocation Project** with all Addenda issued and received prior to scheduled closing time for receipt of Bids, hereby offers, and agrees as follows:

To provide all materials, all labor, and all else whatsoever necessary to receive necessary permits, to construct and properly finish all work to the satisfaction of the Owner for the lump sum of:

WORK ITEMS (these values will be used by the owner as needed to reduce the lump sum cost of the work)

1. Clearing and grubbing_____$
2. Earthwork including all excavation, grading, sand layer, topsoil, stone dust, base for pavements and infield clay_____$
3. Fencing_____$ _
4. Seeding and landscaping_____$___
5. Irrigation_____$___
6. Concrete_____$___
7. Site Improvements including foul poles, flag pole, bleachers, bullpens, benches, bases, moving shed and scoreboard_____$__
8. Site utility's including, sanitary sewer, stormwater, electric and water_____$__

LUMP SUM BID_____$_____

I have received the following addenda:

Addendum # _____ Date _____

Addendum # _____ Date _____

Addendum # _____ Date _____

If awarded this contract, or any part thereof, a contract will be executed between the Bidder and Town of Canton, Owner of the property.

If awarded the Contract, the undersigned proposes that work will be commenced forthwith, and shall be fully completed within 90 calendar days after the signing of the Contract.

I understand that the Owner reserves the right to reject this Bid, but that this Bid shall remain open and shall not be withdrawn for a period of sixty (60) days after the date prescribed for its opening.

If written notice of the acceptance of this Bid is mailed or personally delivered to the undersigned within (60) days after the date set for the opening of this Bid, or at any time thereafter before it is withdrawn, the undersigned bidder will execute and deliver the Contract Documents to the Owner in accordance with this Bid as accepted and will also furnish and deliver, to the Owner, all required Performance and Labor and Materials Payment Bonds and proof of insurance coverage required, all within ten (10) days after personal delivery of, or deposit in, the mail of a notification of acceptance of this Bid.

Name of Bidder _____

Signed By _____ Title_____

Mailing Address _____

State of: _____

County of: _____ ss.

On this _____ day of _____, 2021, personally appeared before me

(*_____)

Name of Person Signing

(**_____ of _____)

Title Name of Bidder

Signed the foregoing Bid and acknowledged the same to be his free act and deed** (as such officer and the free act and deed of said corporation).

_____

Notary Public

* The Bid must be signed by the Bidder, if the Bidder is an individual; by one of the partners, if a partnership; by an authorized officer, if a corporation. The person signing must state the capacity of which he signs at the place indicated.

** If the Bidder is a corporation, the blanks enclosed in parenthesis in the acknowledgment shall be filled with the name of the corporation, corporate seal, and the title of the person signing. If the Bidder is an individual or partnership, the parenthesis should be disregarded.

Bidder's NON-COLLUSION Affidavit

RE: Dyer Softball Field Relocation Project

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

(1) The bid is genuine; it is not a collusive or sham bid;

(2) The bidder developed the bid 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 bidding or competition;

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

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

The undersigned bidder further certifies that this statement is executed for the purpose of inducing the Town of Canton to consider its bid and make an award in accordance therewith.

_____ _____

Legal Name of Bidder (signature)

Bidder's Representative, Duly Authorized

_____

Name of Bidder's Authorized Representative

_____

Title of Bidder's Authorized Representative

_____

Date

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

_____

Notary Public

My Commission Expires: _____

(Acknowledgement if a Corporation)

State of Connecticut)

) ss:

County of _____)

On this the _____________ day of ___________, 20___ before me personally came and appeared ___________________________ to me known, who, being by me duly sworn, did depose and say that he/she is the ____________________________ of _____________________________, the corporation described in and which executed the foregoing instrument; that he/she knows the seal of the corporation; that one of the impressions affixed to said instrument is an impression of such seal; that it was so affixed by order of the directors of said corporation, and that s/he signed her/his name thereto by like order.

(Notary Seal) ____

Commissioner of the Superior Court
Notary Public
My commission expires:

- -

(Acknowledgement of a Partnership)

State of Connecticut)
) ss:
County of Hartford)

On this the _____________ day of ___________, 20___ before me personally came and appeared ____________________________________ to me known, and known to me to be a partner of the partnership described in and which executed the foregoing instrument and he/she acknowledged to me that he/she executed the same as and for a free act of said partnership.

(Notary Seal) ____

Commissioner of the Superior Court
Notary Public
My commission expires:

- -

(Acknowledgement of a Proprietorship)

State of Connecticut)
) ss:
County of Hartford)

On this the ____________ day of _________, 20___ before me personally came and appeared ___________________________ to me known, and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

(Notary Seal) ____

Commissioner of the Superior Court
Notary Public
My commission expires:

BIDDER'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 bidder's regular employees regularly in attendance to carry on the bidder's business in the bidder's own name. An office maintained, occupied and used by a bidder 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 bidder will not be considered a bidder's permanent place of business.

IF A SOLELY OWNED BUSINESS:

Bidder's Full Legal Name

_____

Mailing Address

_____

_____

Owner's Full Legal Name

_____

Does the bidder 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:

Bidder's Full Legal Name

_____

Mailing Address

_____

_____

State in which Legally Organized

_____

State Business ID #

_____

Current Officers

President

_____

Secretary

_____

Chief Financial Officer

_____

Vice President

_____

Treasurer

_____

Does the bidder 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:

Bidder's Full Legal Name _____

Mailing Address _____

State in which Legally Organized_____

State Business ID # _____

Current Manager(s) and Members

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

Does the bidder 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:

Bidder's Full Legal Name _____

Mailing Address _____

State in which Legally Organized_____

State Business ID # (if applicable)_____

Current Partners

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

_____
Name & Title (if any)

_____
Address

Does the bidder 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."

_____

_____

_____
Bidder's Full Legal Name

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

_____
(Signature) Bidder's Representative, Duly Authorized

_____
Date

END OF LEGAL STATUS DISCLOSURE FORM

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions shall be answered and information given shall be clear and comprehensive. This statement shall be notarized. If additional room is required to answer questions, please attach additional sheet(s) with the supplemental information. The bidder's name shall appear on the top of the supplemental sheets to avoid confusion. The bidder may submit additional information as it deems necessary to enable the Town to judge the bidder's ability to perform the proposed Contract.

1. Bidder's full legal name:

2. Permanent main office address:

3. Contact person for this Invitation:

4. Phone and fax numbers and e-mail address of the contact person during normal business hours:

5. Date of organization:

6. Date of incorporation, if applicable:

7. Number of years bidder has been engaged in business under present firm or trade name:

8. Contracts on hand (dollar value, anticipated completion date):

9. General character or type of work performed by the bidder:

10. Has the bidder ever failed to complete any work awarded to it? If so, please explain in detail the circumstances:

11. Has the bidder ever defaulted on a contract? If so, please explain in detail the circumstances:

12. List contracts of a similar nature (size, type, and complexity) completed successfully by the bidder within the last five (5) years. List the other contracting party, the value of the contract, and the year completed.

13. List the equipment that will be available for the work described in this Invitation.

14. How many years of experience does the bidder have in work of similar size, type, and complexity to the Work of this Invitation?

15. Describe the background and experience of each individual person listed in the Bidder's Legal Status Disclosure:

16. Provide the name of the bidder's bank or other financial institution, contact person, phone number, address, and state the bidder's available credit:

17. If necessary for the Town to determine an award of contract, will the bidder provide a detailed financial statement?

18. List all legal disputes (mediation, arbitration or litigation) that the bidder or any predecessor in interest has been involved with in the last five (5) years, the nature of the dispute, the adverse party and the result.

LOCAL PREFERENCE AFFIDAVIT
(If Applicable)

STATE OF _____)
) ss. Date _____
COUNTY OF _____)

_____ (affiant), being first duly sworn, deposes and says:

1) That I am over the age of 18 and understand the obligations of an oath.

2) That I am the owner, partner, officer, representative, or agent of _____, the bidder/proposer that has submitted the attached bid/proposal.

3) That bidder/proposer has a principal place of business located at _____, which is in the Town of Canton.

4) That the bidder/proposer is current on all taxes, both personnel and real estate and all fees, including, but not limited to sewer use fees.

5) That if bidder/proposer is not the owner of the real estate where such principal place of business is located, then bidder/proposer is submitting proof that such address is the bona fide principal place of business, such as a lease or personnel property tax bill.
6) That bidder/proposer has read the Local Bidder Preference Policy and being aware of its terms and conditions, swears that it is a qualified "Town Based Resident Bidder" as specified in the Policy.

(Signed) _____
Affiant

(Title) _____

On this _____ day of _____, 20__, before me personally appeared _____, who made oath that he/she has read the foregoing Local Preference Affidavit and that based on his/her own knowledge believe the same to be true.

_____
Notary Public (My Comm. Expires)
Commissioner of the Superior Court

NONDISCRIMINATION CERTIFICATION

INSTRUCTIONS

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the Town of Canton valued at $50,000 or more for any year of the contract. Complete all sections of the form. Sign form in the presence of a commissioner of Superior Court or Notary Public. Submit prior to the Town of Canton prior to contract execution.

AFFIDAVIT

I, the undersigned, am over the age of eighteen (18) and understand and appreciate the obligations of an oath.

I am _____ of _____, an entity
Signatory's Title Name of Entity

Duly formed and existing under the laws of _____.
Name of State or Commonwealth

I certify that I am authorized to execute and deliver this affidavit on behalf of

_____ and that _____
Name of Entity

Name of Entity has a policy in place that complies with the nondiscrimination agreements and warranties of Connecticut § § 4a-60 and 4a-60a, as amended.

_____
(Authorized Signatory)

_____
(Printed Name)

Sworn and subscribed to before me on this _____ day of _____ 20____

_____
Commission of the Superior Court

Commission Expiration Date _____
Or Notary Public

Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 21-24509

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: Canton
Project Town: Canton
State#: Canton
FAP#: Canton
Project: Replacement of Softball Field (Canton)

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	36.45	34.44
2) Carpenters, Piledrivermen	35.57	25.65
2a) Diver Tenders	35.57	25.65
3) Divers	44.03	25.65
03a) Millwrights	35.64	26.49
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	53.9	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

As of: July 13, 2021

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	31.5	23.25
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.75	23.25
10) Group 3: Pipelayers	32.0	23.25
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	32.0	23.25
12) Group 5: Toxic waste removal (non-mechanical systems)	33.5	23.25
13) Group 6: Blasters	33.25	23.25
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	32.5	23.25
Group 8: Traffic control signalmen	18.0	23.25
Group 9: Hydraulic Drills	32.25	23.25
----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	33.73	23.25 + a
13b) Brakemen, Trackmen	32.76	23.25 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		

14) Concrete Workers, Form Movers, and Strippers	32.76	23.25 + a
15) Form Erectors	33.09	23.25 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.76	23.25 + a
17) Laborers Topside, Cage Tenders, Bellman	32.65	23.25 + a
18) Miners	33.73	23.25 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	40.22	23.25 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	40.02	23.25 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	38.04	23.25 + a
21) Mucking Machine Operator	40.81	23.25 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	30.16	27.16 + a
Three axle trucks; two axle ready mix	30.27	27.16 + a
Three axle ready mix	30.33	27.16 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	30.39	27.16 + a
Four axle ready-mix	30.44	27.16 + a
Heavy duty trailer (40 tons and over)	30.66	27.16 + a

Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	30.44	27.16 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	43.88	25.80 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	43.53	25.80 + a
Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	42.72	25.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	42.3	25.80 + 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	41.65	25.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	41.65	25.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	41.31	25.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	40.94	25.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	40.51	25.80 + 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).	40.04	25.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	37.81	25.80 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	37.81	25.80 + a
Group 12: Wellpoint Operator.	37.74	25.80 + a

Group 13: Compressor Battery Operator.	37.11	25.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	35.87	25.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	35.43	25.80 + a
Group 16: Maintenance Engineer/Oiler	34.72	25.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	39.42	25.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	36.77	25.80 + 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

As of: July 13, 2021

Project: Replacement of Softball Field (Canton)

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

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

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

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

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

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

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

As of: July 13, 2021

Project: Replacement of Softball Field (Canton)

~~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: July 13, 2021

Important Information:
For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.

**Note: Hazardous waste premium $3.00 per hour over classified rate.

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; holsting engineer (2 drums or over)
2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
3) Cranes (under 100 ton rated capacity)

Crane with boom including jib, 150 feet - $1.50 extra.

Crane with boom including jib, 200 feet - $2.50 extra.

Crane with boom including jib, 250 feet - $5.00 extra.

Crane with boom including jib, 300 feet - $7.00 extra.

Crane with boom including jib, 400 feet - $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 one 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.ctdol.state.ct.us.
- 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.

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 Persons 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.

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Contingency allowances.

1.3 DEFINITIONS

A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

A. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.2 SCHEDULE OF ALLOWANCES

A. Contingency Allowance: Include a contingency allowance of $75,000.00 for use according to Owner's written instructions.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

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

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise 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. Execute accepted alternates under the same conditions as other Work of the Contract.

C. Schedule: A Part 3 "Schedule of Alternates" Article 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 - Underdrainage

END OF SECTION 012300

SECTION 013100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. General coordination procedures.
2. RFIs.
3. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request for Information. Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 GENERAL COORDINATION PROCEDURES

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 to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination of Multiple Contracts: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with 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 other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

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

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

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

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 REQUEST FOR INFORMATION (RFI)

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

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

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

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Architect's Project number.

6. Date.
7. Name of Contractor.
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 7 days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
2. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number, including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within 7 days if Contractor disagrees with response.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawing will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.

1.7 PROJECT MEETINGS

A. General: Architect will schedule meetings and conferences at Project site unless otherwise indicated.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 5 days after execution of the Agreement.

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

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Critical work sequencing and long lead items.
d. Designation of key personnel and their duties.
e. Lines of communications.
f. Procedures for processing field decisions and Change Orders.
g. Procedures for RFIs.
h. Procedures for testing and inspecting.
i. Procedures for processing Applications for Payment.
j. Distribution of the Contract Documents.
k. Submittal procedures.
l. Preparation of Record Documents.
m. Use of the premises and existing building.
n. Work restrictions.
o. Working hours.
p. Owner's occupancy requirements.
q. Responsibility for temporary facilities and controls.
r. Procedures for disruptions and shutdowns.
s. Construction waste management and recycling.
t. Parking availability.

u. Office, work, and storage areas.
v. Equipment deliveries and priorities.
w. First aid.
x. Security.
y. Progress cleaning.

C. Project Closeout Conference: Architect will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 7 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Submittal of written warranties.
b. Requirements for preparing operations and maintenance data.
c. Requirements for demonstration and training.
d. Preparation of Contractor's punch list.
e. Procedures for processing Applications for Payment at Substantial Completion and for final payment.

D. Progress Meetings: Architect will conduct progress meetings at weekly intervals.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
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. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list 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. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.

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

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

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

i. Scheduled dates for installation.
j. Activity or event number.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

B. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

C. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.

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

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.

    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 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 7 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 7 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 7days for initial review of each submittal.

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

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect' action stamp.

E. 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.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

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

1. If information must be specially prepared for submittal because standard published data are unsuitable 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.

B. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.

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

    a. Project name and submittal number.
    b. Generic description of Sample.
    c. Product name and name of manufacturer.
    d. Sample source.
    e. Number and title of applicable Specification Section.
    f. Specification paragraph number and generic name of each item.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleanup.

1.3 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. 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. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. 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. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

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.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair, or remove and replace, defective construction.

END OF SECTION 017700

SECTION 020000 - GENERAL SITEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

A. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

1.3 DESCRIPTION

A. This project involves park improvements including renovations to 4 existing fields, new walks, pavilion and shade structures, fencing, planting and other improvements.

1.4 QUALITY ASSURANCE

A. Obtain and pay for all required inspections, permits and fees. Provide notices required by governmental authorities.

B. Comply with all applicable local, state and federal requirements regarding materials, methods of work and disposal of excess and waste materials.

1.5 GENERAL JOB CONDITIONS

A. Locate and identify existing underground and overhead services and utilities within contract limit work areas. Provide adequate means of protection of utilities and services designated to remain. Repair utilities damage during sitework operations at Contractor's expense.

B. Protect and maintain all existing utility appurtenances and improvements except items designated for removal.

C. When uncharted or incorrectly charted underground piping or other utilities and services are encountered during sitework operations, notify the applicable utility company immediately to obtain procedure directions. Cooperate with the applicable utility company in maintaining active service operation.

D. Locate, protect and maintain bench marks, monuments, control points and project engineering reference points. Re-establish disturbed or destroyed items at Contractor's expense.

E. Perform sitework operations to assure minimum interference with streets, walks and other adjacent facilities.

F. Obtain written permission when required to close or obstruct driveways, walks or adjacent facilities. Provide alternative routes around closed or obstructed traffic ways when required.

G. Control dust caused by the work with calcium chloride conforming to ASTM D-98, or water. Special care shall be taken by the Contractor to control dust and debris due to construction. Dampen surfaces prior to significant earthwork or other grading operations and clean the site on a regular basis to minimize unsightly or dangerous debris.

H. Protect existing building, paving and other services or facilities on site and adjacent to the site from damage caused by sitework operation. Cost of repair and restoration of damaged items shall be at the Contractor's expense.

I. All required submittals shall be in accordance with Division 1 submittal requirements.

J. Coordinate all work of each section with related work of other sections. Failure to coordinate properly will not reduce the obligation to meet the standards of acceptance of the various elements of work contained herein.

K. Examine all work that the work of each section is contingent upon and report any deficiencies to the Owner's Representative. Commencement of work will be construed to mean complete acceptance of the preparatory work of others. No adjustment will be made for discrepancies brought to the Owner's Representative attention after work has begun.

1.6 GENERAL JOB CONDITIONS

A. The contractor shall provide for maintenance and protection of traffic, including permits and plans as required per the Town of Canton.

B. Provide, place, move, maintain and dismantle such barricades, warning signs and lights as necessary to adequately protect the work and provide for public safety.

C. Furnish flagmen or police as required for the proper direction and control of traffic during the construction period.

1.7 STANDARD SPECIFICATIONS

A. All reference to the Standard Specifications refers to CT DOT Form 817. A copy of these specifications shall be available on site at all times.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. As selected by Contractor, except as indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine the areas and conditions under which sitework is performed. Do not proceed with the work until unsatisfactory conditions are corrected.

END OF SECTION 020000

SECTION 107516 - GROUND-SET FLAGPOLES

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 ground-set flagpoles made from aluminum (if used instead of salvaging existing poles)

B. Related Sections include the following:

1. Section 033001 “Cast-in-Place Concrete” for concrete footings for flagpoles.

1.3 SUBMITTALS

A. Product Data: For each flagpole and flag.

1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For flagpoles.

1. Include plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
2. Include section, and details of foundation system.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

B. Available Manufacturers:
   1. American Flagpole; a Kearney-National Inc. Company.
   2. Pole-Tech Company Inc.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.

   1. Wind Loads: Determine according to NAAMM FP 1001.
   2. Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

2.3 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B241/B241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.

B. Exposed Height: 30’.

C. Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

   1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
   2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch wall thickness with 3/16-inch steel bottom plate and support plate; 3/4-inch diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

   1. Flashing Collar: Same material and finish as flagpole.

E. Sleeve for Aluminum Flagpole: Fiberglass or PVC pipe foundation sleeve, made to fit flagpole, for casting into concrete foundation.

   1. Flashing Collar: Same material and finish as flagpole.

F. Cast-Metal Shoe Base: Made from aluminum with same finish and color as flagpoles for anchor-bolt mounting; furnish with anchor bolts.

1. Furnish ground spike.

2.4 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch spun aluminum, finished to match flagpole.

B. External Halyard: Ball-bearing, nonfouling, revolving truck assembly of cast metal with continuous 5/16-inch- diameter, braided polypropylene halyard and 9-inch cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.

1. Halyards and Cleats: Two at each flagpole.
2. Cleat Covers: Cast metal, finished to match flagpole, secured with cylinder locks.
3. Halyard Covers: 2-inch channel, 60 inches long, finished to match flagpole.
4. Halyard Flag Snaps: Stainless-steel swivel snap hooks with neoprene or vinyl covers. Furnish two per halyard.

2.5 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

C. Sand: ASTM C33/C33M, fine aggregate.

D. Elastomeric Joint Sealant: Single-component neutral-curing silicone joint sealant complying with requirements in Section 079200 "Joint Sealants."

E. 5’ x 8’ U.S. Nylon Flag, Connecticut State Flag

2.6 ALUMINUM FINISHES

A. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.1 PREPARATION

A. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

B. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

C. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

D. Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.

E. Anchor Bolts: Locate and secure anchor bolts in forms with templates and by tying to reinforcement.

F. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

G. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

END OF SECTION 107516

SECTION 311000 - SITE CLEARING

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. Removing existing trees, shrubs and grass.
2. Clearing and grubbing.

B. Related Sections include the following:

1. Section 312000 "Earth Moving" for soil materials, excavating, backfilling, and site grading.
2. Section 329200 "Turf and Grasses” and “Plants" for finish grading including preparing and placing planting soil mixes and testing of topsoil material.
3. Section 312500 “Erosion Control” for soil stabilization.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other non-soil materials.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

C. Utility Locator Service: Notify utility locator service **Call Before You Dig** for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

E. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

3.3 EXISTING UTILITIES

A. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than seven (7) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Remove stumps and remove roots larger than 2 inches in diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

A. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within tree protection zones.
3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.6 STOCKPILING ROCK

A. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Limit height of rock stockpiles to 36 inches.
2. Do not stockpile rock within tree protection zones.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property at an approved CT DEEP facility.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

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.

B. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

C. NOTE: See Geotechnical Engineering Report, prepared by Down to Earth Consulting, LLC, May 14, 2021, for additional requirements.

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
3. Subbase course for concrete pavement.
4. Subbase and base course for asphalt paving.
5. Excavating and backfilling trenches for utilities and pits for buried utility structures.
6. Removal of rock, ledge, boulders, concrete, masonry, and rubble as required for foundations and site excavations to the lines and grades indicated on the Contract Drawings.
7. Preparing subgrades for athletic fields.
8. As-Built Survey for athletic fields.

B. Related Requirements:

1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
2. Section 329200 "Turf and Grasses" for finish grading, preparing and placing topsoil, planting soil for lawns and planting soil amendments.
3. Section 329300 "Plants" for planting bed establishment, tree and shrub pit excavation, planting soils and soil planting soil amendments.
4. Section 312500 “Erosion Control”.

1.3 REFERENCES

A. A copy of all the following documents shall be kept at the job site for the duration of the contract.

1. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

2. OSHA 24 1926 Safety and Health Regulations for Construction.

1.4 UNIT PRICES

A. Rock Measurement: Volume of rock actually removed, measured in original position. Unit prices for rock excavation include replacement with approved materials.

1.5 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material 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: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices and changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation 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. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom.
2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586.

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: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.6 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

C. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify **"Call Before You Dig"** for area where Project is located before beginning earth-moving operations.

C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 312500 "Erosion Control" are in place.

D. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 “Temporary Tree and Plant Protection” are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. COMMON FILL

1. Bank-run sand, gravel, or mixture graded within following limits:

Sieve Size	% Passing (by weight)
8”	100
#200	0-25

Excavated material may be used if it meets the specification.

2. All common fill material, whether from the excavation or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.

B. SUBBASE COURSE FOR CONCRETE

1. Gravel: Conform to Article M.02.03 From 817 grading “A”

C. SUBBASE COURSE FOR ASPHALT PAVING

1. Subbase: Conform to Article M.02.02 Form 817

D. BASE COURSE FOR ASPHALT PAVING

1. Process Aggregate: Conform to Article M.05.01 Form 817

E. TOPSOIL

1. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; screened and free of stones 1/4 inch or larger in any dimension and other extraneous materials harmful to plant growth. Topsoil shall contain no foreign material such as broken glass, trash, roots, etc.

2. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Screen soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

   a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

F. GRANULAR FILL (SAND)

1. For use as drainage medium should conform to 2mm ASTM 2396 sand.

G. CRUSHED STONE

1. For use around drains should conform to CTDOT Form 817, Article M.01.01 (Gradation No. 8) and graded within the following limits:

Sieve Size	Percent finer by weight
1/2-inch	100%
3/8-inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

2.2 INFIELD MIX

A. DuraEdge Intermediate.

2.3 PITCHER'S CIRCLE AND BATTER'S BOX CLAY

A. All natural, extra firm, red clay, or clay bricks (sand, 15-20%, clay greater than 35%, silt/clay ratio .75-1.25) provided by Reid Custom Soils or approved equal.

2.4 STONE DUST

A. Grading per ASTM F2270

Square Mesh Size	Passing
6.35mm	95-100 %
.3mm	>80%
.05 mm	<5%

2.5 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) 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.

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 earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

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.

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.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives without written permission from authorities having jurisdiction.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.
b. 12 inches outside of concrete forms at footings.
c. 6 inches outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs-on-grade.
f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.
b. 12 inches outside of concrete forms at footings.
c. 6 inches outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs-on-grade.
f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, 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.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Cut and protect roots according to requirements in Section 015639 “Temporary Tree and Plant Protection.”

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit or as indicated.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices or changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 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, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Trenches under Roadways: Provide 4-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course.

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material.

a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

G. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

H. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

D. For Athletic Fields place fill and topsoil materials in layers not more than 6 inches in loose depth.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

D. For Athletic Fields:

1. Roll with an 8-foot turf roller, tow behind, not more than 2500 lbs. to firm surface, not compact.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

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.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf 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 for Athletic Fields:

1. Grading shall be performed with a laser grade spectra physics dual slope laser system. Land leveler shall be a tow type base blade with 4 tires that support the blade and keep it level. Leveler shall be powered by and independent receiver that receives a signal from the laser. An electric/hydraulic valve shall automatically raise and lower the blade.
2. All equipment used on the field shall be wide track or rubber turf tire type.

3. Grading accuracy shall be to within ¼”
4. Finish the surface with a Kuhn power harrow and barber tow behind stone picker/field finisher for a clean, lightly loose soil ready for seed.

3.17 SUBBASE COURSE UNDER CAST-IN PLACE CONCRETE AND CONCRETE PAVEMENTS

A. Place subbase course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact subbase course under cast-in-place concrete and concrete pavement as follows:

1. Install subdrainage and geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends as required.
2. Place subbase course 6 inches or less in compacted thickness in a single layer.
3. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact each layer of subbase course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.18 SUBBASE AND BASE COURSES UNDER ASPHALT PAVEMENTS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends as required.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D1557.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D1557.

3.19 FIELD QUALITY CONTROL

A. Special Inspections: Owner may engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area but in no case fewer than three tests.
2. Foundation and Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

G. For Athletic Fields: Prior to seeding Contractor shall engage a qualified independent land surveyor to verify grading accuracy at all fields. Spot elevations shall be provided on a 20’ grid. If field does not meet specified

3.20 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 Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Material must be handled in accordance with applicable CT DEEP regulations regarding clean fill, solid waste, and remediation standards.

END OF SECTION 312000

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

May 14, 2021
File No. 0061-010.00

Mr. W. Phillips Barlow, PLA AICP
TO Design, LLC
114 West Main Street, Suite 202
New Britain, CT 06051

Via email: WPBarlow@todesignllc.com

Re: Geotechnical Engineering Report
Proposed Little League Softball Field
76 Simonds Avenue, Collinsville, Connecticut

Dear Phil:

Down To Earth Consulting, LLC (DTE) prepared this geotechnical engineering report for the proposed softball field located at 76 Simonds Avenue in Collinsville, Connecticut (Site) for TO Design, LLC (Client). An Area Plan is included as Figure 1.

Existing conditions and proposed features related to Site development are generally based on the Client's provided drawing (*Grading Plan,* Canton Little League Softball Field, Collinsville, CT prepared by the Client, dated April 30, 2021).

Elevations (El.) stated in this report are in feet and reference the topographic information in the provided *Grading Plan*. This report is subject to the limitations presented in Appendix A.

EXISTING SITE CONDITIONS AND PROJECT UNDERSTANDING

The Site is generally located on the Canton High School campus and is immediately surrounded by Simonds Avenue to the south, the Canton High School access road to the west, existing ballfields to the north, and wetlands to the east. Existing Site grades are relatively level at about El. 348 to 350+/- in the area of proposed improvements. The Site is currently undeveloped and wooded.

Proposed improvements will generally consist of a natural turf field (and associated infield areas) and proposed grade changes will require about 2 to 3 feet of fill. Our objective was to collect subsurface data and develop geotechnical design and construction recommendations for the proposed softball field. Refer to Figure 2 for existing conditions and our understanding of the proposed limits of reconstruction.

SUBSURFACE CONDITIONS

Geologic Information

We reviewed available subsurface/geologic information in the vicinity of the project area (1:125,000 scale, *Surficial Materials Map of Connecticut, Janet Radway Stone, 1992* and *Bedrock Geological Map of Connecticut, John Rodgers, 1985)*.

The surficial material within the Site area is mapped as outwash deposits (sand and gravel) overlying gneiss bedrock.

Subsurface Explorations

We observed and logged four test pit excavations (TP-1 through TP-4) excavated by Town of Canton Department of Public Works personnel. Test pit locations are depicted on Figure 2 (Appendix 1) and the logs are included in Appendix 2. The test pits were excavated to explore the soil, groundwater, and bedrock conditions in the project area. Excavations were advanced to depths of approximately 2.5 to 4 feet below existing grades. Groundwater levels were measured using a weighted tape in open excavations.

Generalized Subsurface Profile

Based on the subsurface explorations completed at the Site, the general soil profile consists of Subsoil overlying natural Outwash Deposits (i.e., Gravelly Sand). An 8- to 18-inch layer of Topsoil/Forest Debris was also encountered at the surface of each exploration. Bedrock was not encountered within the limits of the explorations. The encountered strata are described below in order of increasing depth.

- *Subsoil* – Subsoil was encountered at each of the test pit locations directly below Topsoil/Forest Debris. This material ranged in thickness from about 1 to 1.5 feet and generally consisted of loose, orange-brown, fine to coarse sand with some to and amounts of silt (about 20 to 50%) and little to some amounts (about 10 to 35%) of fine to coarse Gravel. The subsoil did not have an organic odor, but trace (0 to 5%) amounts of organics (e.g., rootlets) were observed in this material. Ubiquitous cobbles and boulders were also observed above and within this stratum.

- *Outwash Deposits* – The Outwash Deposits (Gravelly Sand on the logs) were encountered in the explorations at approximately 2 to 2.5 feet below grade. The Outwash Deposits generally consisted of medium dense, gray, fine to coarse sand with varying amounts of gravel and trace to little amounts (5% to 20%) of silt. Mottling was observed within this stratum (particularly along the northern Site limits) which would indicate the presence of seasonal high groundwater levels.

Groundwater was not encountered within the limits of the explorations. Water levels measured in the test pits may not have had sufficient time to stabilize during the explorations and should be considered approximate. Groundwater levels will vary depending on factors such as temperature, season, precipitation, construction activity, and other conditions, which may be different from those at the time of these measurements.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

The geotechnical recommendations presented below are based on our evaluation of the available data and design concepts provided to DTE and are subject to the limitations contained in Appendix A.

Site Preparation

Based on the provided *Grading Plan*, two to three feet of fill will be required to establish proposed grades. Prior to fill placement, all surficial organic and debris materials (i.e., Topsoil, Forest

Debris, and organic containing Subsoil) must be removed and the resulting subgrade surface compacted with a minimum of four passes with a vibratory drum roller having a minimum dynamic force of 4,000 lbs. per foot of drum width under the observation of a qualified Geotechnical Engineer. Areas exhibiting instability shall receive additional compaction and/or be over-excavated and replaced with Compacted Granular Fill (CGF), as recommended by the Geotechnical Engineer. Modifications to this procedure may be required if the subgrade is saturated.

Outfield Drainage

Subsurface drains are not required in the outfield due to the proposed thickness of free-drainage CGF and our understanding that there will not be a demand to use the field immediately after a significant rain event.

Infield Drainage

We recommend a minimum of six inches of Sand beneath proposed infield surface soils (infield "clay"). A geotextile fabric should be placed between the Sand and subgrade soils. A proprietary drainage panel could be considered beneath the Sand to allow for a potential reduction in the 6-inch thickness.

Fill Materials and Placement

Recommended earthwork materials are as follows:

Compacted Granular Fill (CGF) should consist of inorganic soil free of clay, loam, ice and snow, tree stumps, roots, and other organic matter; graded within the following limits:

Sieve Size	Percent finer by weight
4-inches	100%
No. 10	30 - 100
No. 40	10 - 90
No. 200	0 - 15

CGF should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D1557.

Sand for use as drainage medium should be graded within the following limits:

Sieve Size	Percent finer by weight
3/8-inch	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

Sand should be compacted to at least 92 percent of its maximum dry density as determined by ASTM D698.

Crushed Stone for use on wet subgrades, as an alternative for CGF, or as drainage fill shall consist of sound, tough, durable, rock that is graded within the following:

Sieve Size	Percent finer by weight
5/8-inches	100%
1/2-inch	85 - 100
3/8 inch	15 - 45
No. 4	0 - 15
No. 8	0 - 5

Common Fill may be used for general site grading, and other areas as appropriate, or as directed by the Geotechnical Engineer or his/her representative. The material should not be used beneath sensitive structures or areas that are expected to be free draining. Common Fill should conform to the following gradation requirements:

Sieve Size	Percent finer by weight
6-inches	100%
No. 200	0 - 25

Geotextile Fabric used as a separation fabric should meet the following criteria:

Property	Criteria	Test Method
Grab Strength	min. 120lbs	ASTM D4632
Static (CBR) Puncture	min. 310lbs	ASTM D6241
Trapezoid Tear	min. 50lbs	ASTM D4533
Apparent Opening Size	No. 70-100 U.S. Sieve Size	ASTM D4751

Fabric should be needle-punched non-woven material. Seams should be overlapped a minimum of six inches. During stone placement, the stone drop height should not exceed three feet and equipment traffic should be kept off the fabric until at least 6 to 12 inches of material is placed.

Temporary Excavation Support

The existing site soils are classified as OSHA Class “C” soil and can be cut at a maximum one vertical to one and a half horizontal (1V:1.5H) slope up to the anticipated maximum excavation depth of 5 feet. These maximum slope and excavation depths assume no surcharge load (i.e., stockpiles, construction equipment, etc.) at the top of the excavations or groundwater seepage.

Temporary Groundwater Control

We expect that temporary stormwater control can be accomplished by means of shallow trenches and sumps and grading the excavation to low points.

REVIEW OF FINAL PLANS AND SPECIFICATIONS

When project plans and specifications are available they should be provided to DTE for review of conformance with our geotechnical recommendations. If any changes are made to the proposed ballfield, the recommendations provided in this report will need to be verified by DTE for applicability.

CLOSURE

We trust the information presented herein is sufficient for your use to progress design of the proposed Little League Softball Field improvements project. We have enjoyed working with you on this project and please do not hesitate to call us if you have any questions.

Sincerely,

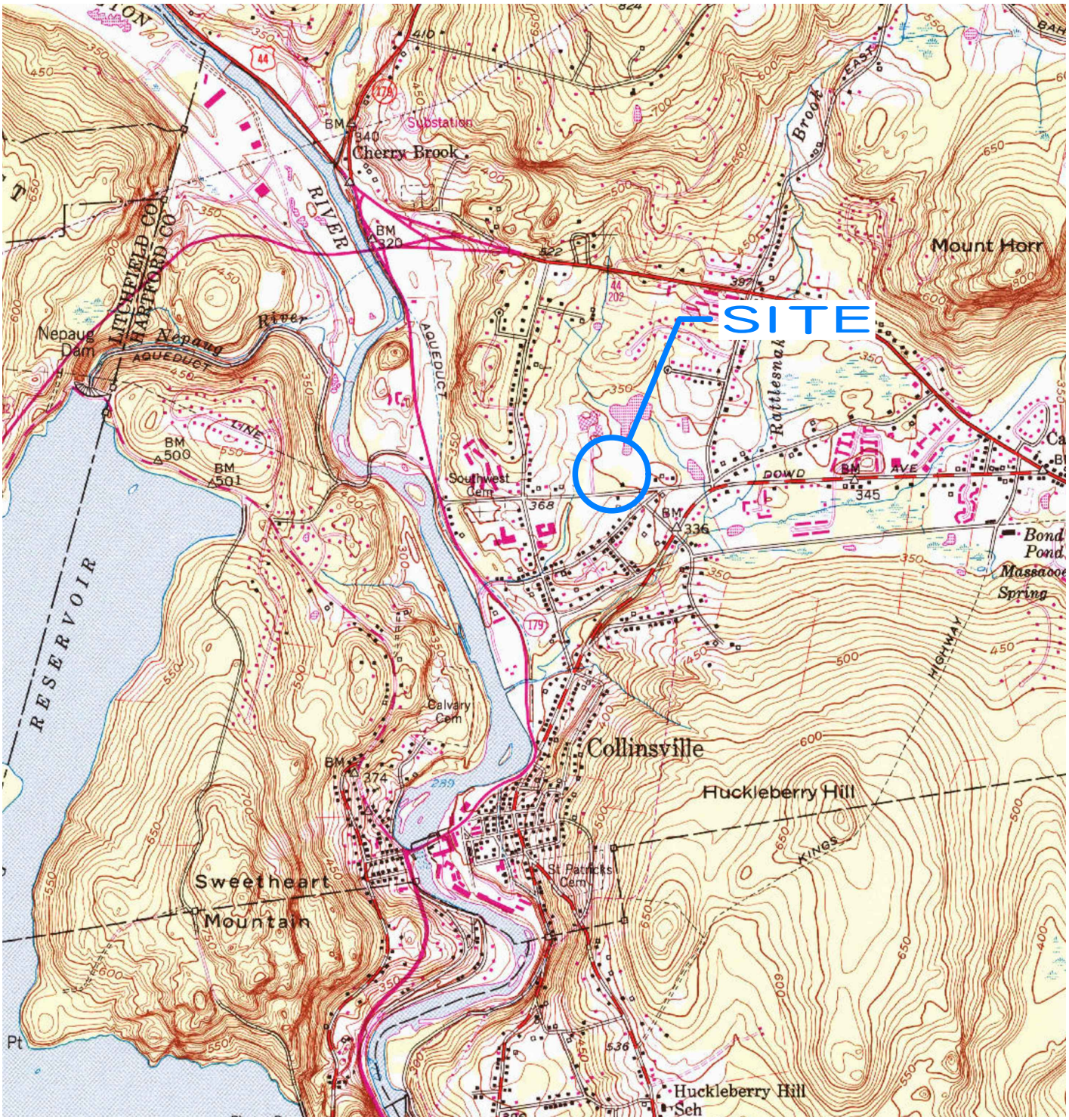
DOWN TO EARTH CONSULTING, LLC

Raymond P. Janeiro, PE
Principal

Daniel F. LaMesa, P.E.
Principal/Reviewer

Attachments: Figure 1 – Area Plan
Figure 2 – Exploration Location Plan
Appendix A – Limitations
Appendix B – Test Pit Logs

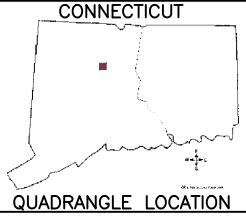
FIGURES



DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

CONNECTICUT



QUADRANGLE LOCATION

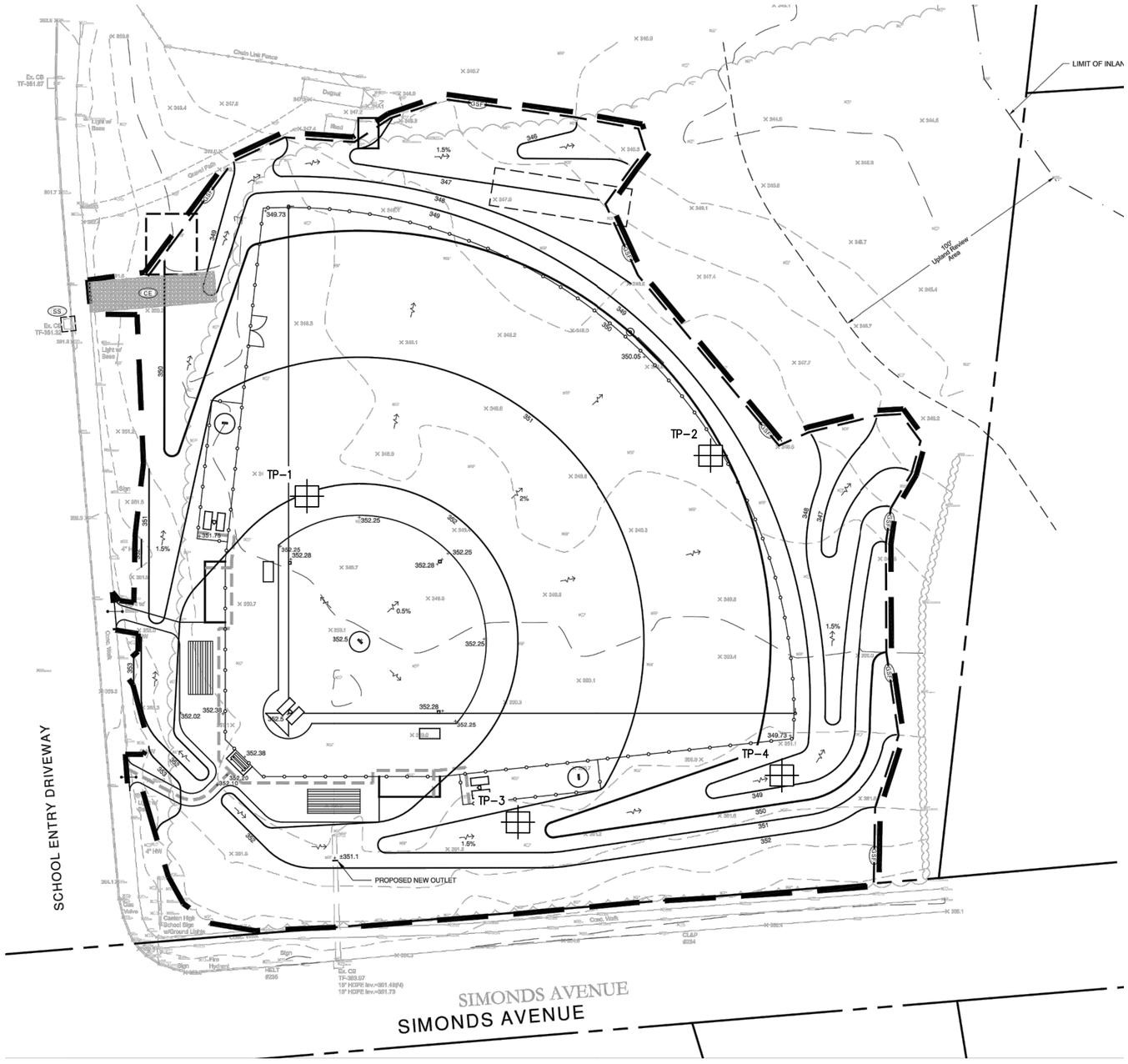
AREA PLAN
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

REFERENCE:
USGS TOPOGRAPHIC QUADRANGLE: COLLINSVILLE, CT

SCALE 1"= 2,000'

2,000' 1,000' 0 2,000'

DRAWN BY: MF	REVIEWED BY: RPJ
PROJECT NO.	0061-010.00
DATE:	5/12/21
FIGURE NO.	1



LEGEND

TP−1 — TEST PITS NO. AND APPROX. LOCATION BY DOWN TO EARTH CONSULTING, LLC

NOTES:

1) BASE MAP DEVELOPED FROM AN ELECTRONIC FILE PREPARED BY TO DESIGN, ENTITLED "GRADING PLAN, CANTON LITTLE LEAGUE SOFTBALL FIELD, COLLINSVILLE, CT". DATED APRIL 21, 2021. ORIGINAL SCALE 1"=20'.
2) TEST PITS WERE COMPLETED BY TOWN OF CANTON DEPARTMENT OF PUBLIC WORKS PERSONNEL AND OBSERVED BY DOWN TO EARTH CONSULTING, LLC.
3) THE LOCATIONS OF THE EXPLORATIONS WERE DETERMINED BY TAPING AND VISUAL ESTIMATES FROM EXISTING SITE FEATURES. THESE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

DESIGNED BY OTHERS						
DRAWN BY MF						
CHECKED BY RPJ						
APPROVED BY RPJ	NO.	DATE	REVISIONS	DRWN.	CHKD	APPVD

SCALE 1" = 50'

50' 25' 0 50'

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

DWG. TITLE.
SITE AND EXPLORATION LOCATION PLAN

FILE NO. 0061−010.00

SCALE AS NOTED

DATE 5/12/2021

FIGURE NO. 2

APPENDIX A -

LIMITATIONS

LIMITATIONS

Explorations

1. The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations by Down To Earth Consulting, LLC (DTE) and others. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the test pit logs.

3. Water level readings have been made in the excavations at times and under conditions stated on the test pit logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time measurements were made.

Review

4. In the event that any changes in the nature, design or location of the proposed field improvements are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by DTE. It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Construction

5. It is recommended that this firm be retained to provide soil engineering services during construction of the earthworks and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

Use of Report

6. This report has been prepared for the exclusive use of TO Design for specific application to the project noted in this geotechnical report in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

7. This soil and foundation engineering report has been prepared for this project by DTE. This report is for design purposes only and is not sufficient to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

8. This report may contain comparative cost estimates for the purpose of evaluating alternative foundation schemes. These estimates may also involve approximate quantity evaluations. It should be noted that quantity estimates may not be accurate enough for construction bids. Since DTE has no control over labor and materials cost and design, the estimates of construction costs have been made on the basis of experience. DTE does not guarantee the accuracy of cost estimates as compared to contractor's bids for construction costs.

APPENDIX B -

TEST PIT LOGS

TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

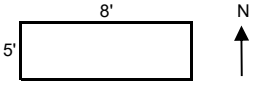
TEST PIT NO.	TP-1
SHEET	1 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	13:00 - 13:30
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	Remarks
1	10"-12"+/- Topsoil/Forest Debris				
2	SUBSOIL	Orange-brown, fine to coarse SAND and SILT, little fine Gravel, trace (-) Roots, with cobbles and boulders	E	2 - A 1 - B 1 - C	
3	GRAVELLY SAND	Gray, fine to coarse SAND, some fine Gravel, trace Silt, with cobbles, mottled	M		
4		End of Exploration at 3 Feet Below Grade			
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: Groundwater not encountered.

WATER SYMBOLS
Groundwater
Estimated Seasonal High Groundwater



BOULDER	CLASS
12" - 24"	A
24" - 36"	B
>36"	C

PROPORTIONS USED
0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT
E = Easy
M = Moderate
D = Difficult

TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

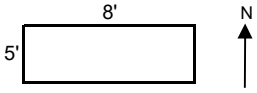
PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

TEST PIT NO.	TP-1
SHEET	2 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	13:00 - 13:30
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

N

Notes: 1.) Photo of in-progress TP-1



TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

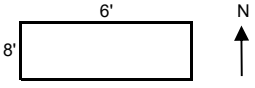
TEST PIT NO.	TP-2
SHEET	1 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	13:30 - 14:00
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	Remarks
1	10"-18"+/- Topsoil/Forest Debris				
2	SUBSOIL	Orange-brown, fine to coarse SAND and SILT, little fine to coarse Gravel, trace (-) Roots, with cobbles and boulders	D	>5 - A >5 - B >5 - C	
3					
4	GRAVELLY SAND	Gray, fine to coarse SAND, some Silt, some fine to coarse Gravel, with cobbles and boulders, mottled			
5		End of Exploration at 4 Feet Below Grade			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: Groundwater not encountered.

WATER SYMBOLS
▼ Groundwater
∇ Estimated Seasonal High Groundwater



BOULDER	CLASS
12" - 24"	A
24" - 36"	B
>36"	C

PROPORTIONS USED
0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT
E = Easy
M = Moderate
D = Difficult

TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

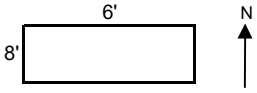
PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

TEST PIT NO.	TP-2
SHEET	2 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	13:30 - 14:00
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

N

Notes: 1.) Photo of in-progress TP-2



TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

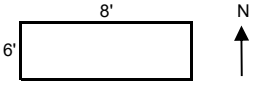
TEST PIT NO.	TP-3
SHEET	1 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	14:00 - 14:30
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	Remarks
1	10"-12"+/- Topsoil/Forest Debris		M	6 - A 4 - B 2 - C	
2	SUBSOIL	Orange-brown, fine to coarse SAND and SILT, little fine Gravel, trace (-) Roots, with cobbles and boulders	D		
3	GRAVELLY SAND	Gray, fine to coarse SAND, some fine Gravel, little Silt, with cobbles	M		
4		End of Exploration at 2.5 Feet Below Grade			
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: Groundwater not encountered.

WATER SYMBOLS
Groundwater
Estimated Seasonal High Groundwater



BOULDER	CLASS
12" - 24"	A
24" - 36"	B
>36"	C

PROPORTIONS USED	
0-10%	Trace
10-20%	Little
20-35%	Some
35-50%	And

EXCAVATION EFFORT
E = Easy
M = Moderate
D = Difficult

TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

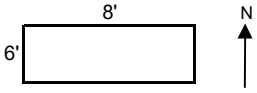
PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

TEST PIT NO.	TP-3
SHEET	2 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	14:00 - 14:30
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

N

Notes: 1.) Photo of in-progress TP-3



TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

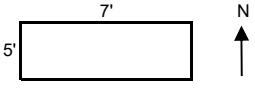
TEST PIT NO.	TP-4
SHEET	1 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	14:30 - 14:50
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	Remarks
1	8"-10"+/- Topsoil/Forest Debris				
2	SUBSOIL	Orange-brown, fine to coarse SAND, some Silt, some fine to coarse Gravel, trace (-) Roots, with cobbles and boulders	M	4 - A 3 - B	
3	GRAVELLY SAND	Gray, fine to coarse SAND and GRAVEL, trace Silt, with cobbles			
4		End of Exploration at 3 Feet Below Grade			
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: Groundwater not encountered.

WATER SYMBOLS
Groundwater
Estimated Seasonal High Groundwater



BOULDER	CLASS
12" - 24"	A
24" - 36"	B
>36"	C

PROPORTIONS USED	
0-10%	Trace
10-20%	Little
20-35%	Some
35-50%	And

EXCAVATION EFFORT
E = Easy
M = Moderate
D = Difficult

TEST PIT LOG

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

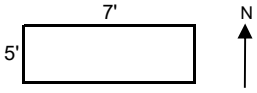
PROJECT
LITTLE LEAGUE SOFTBALL FIELD
76 SIMONDS AVENUE
COLLINSVILLE, CONNECTICUT

TEST PIT NO.	TP-4
SHEET	2 of 2
FILE NO.	0061-010.00
CHKD BY	RPJ

Engineer	Ray Janeiro, P.E.	Make/Model	Takeuchi TB285	Ground El.	Not Available
Contractor	Canton Public Works	Capacity	≈ 1/4 yd3	Time Start/End	14:30 - 14:50
Weather	70s, Overcast	Reach	20 feet +/-	Date	5/26/2021

N

Notes: 1.) Photo of in-progress TP-4



SECTION 312500 – EROSION CONTROL

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. The work of this Section includes, but is not limited to the furnishing of all labor, materials and equipment required to provide silt fences, erosion control linings and any other measures necessary to prevent erosion and resulting sedimentation in areas adjacent to the site improvement.

1.3 REFERENCES

A. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

B. CT Guidelines for Soil Erosion and Sediment Control-2002 published by CT Council on Soil and Water Conservation in cooperation with the Connecticut Department of Environmental Protection.

C. Qualifications: Engaged firm shall be able to demonstrate experience in the installation of the erosion and sedimentation controls described in the Contract Documents.

1.4 SUBMITTALS

A. Provide written certification of compliance to the specification for the following:

1. Silt Fence.
2. Silt Sack.

1.5 PROJECT CONDITIONS OR SITE CONDITIONS

A. Environmental Requirements: Protect adjacent properties and water resources from erosion and sediment damage throughout Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Silt Fences:

1. Filter Fabric Fence: The fabric used shall be a CTDOT approved non-woven material and a minimum of 30-inches high, fastened to stakes as approved by CTDOT.

a.	Grab Strength	ASTM -D-4632	124 lbs.
b.	Grab elongation	ASTM - D-4632	15%
c.	Puncture	ASTM -D-4833	65 lbs.
d.	UV Resistance	ASTM -D-4355	80@500hrs
e.	Flow rate	ASTM-D-449	110/gal min/SF

2. Posts: Provide 1 ½ x 1 ½" x 4' wood or metal posts.

B. Straw hay bales for catch basin protection shall be free of weed seed.

C. Siltsack:

1. Siltsack shall be manufactured from a specially designed woven polypropylene geotextile and sewn by a double needle machine, using a strength nylon thread – ACF Environmental or equal.
2. Siltsack will be manufactured to fit the opening of the catch basin or drop inlet. Siltsack will have the following features: two dump straps attached at the bottom to facilitate the emptying of Siltsack; Siltsack shall have lifting loops as an integral part of the system to be used to lift Siltsack from the basin; Siltsack shall have a restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls, this yellow cord is also a visual means of indicating when the sack should be emptied. Once the cord is covered with sediment, Siltsack should be emptied, cleaned and placed back in the basin.
3. Siltsack seams shall have a certified average wide width strength per ASTM D-4884.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Comply with Form 817, Section 2.10.03.

B. Silt Fences:

1. Install silt fences in the locations shown and as detailed and described in the Contract Documents. Silt fence shall be installed with end runs turned up grade at 45° for a distance of 2'.

2. Drive the support posts firmly into the ground so as to maintain the silt fence in a vertical position.

C. Hay Bales:

1. Hold in place by (2) 2" x 2" x 36" stakes, as detailed on drawings.

D. Siltsack:

1. To install Siltsack in the catch basin, remove the grate and place the sack in the opening. Hold approximately six inches of the sack outside the frame. This is the area of the lifting straps. Replace the grate to hold the sack in place.
2. To empty Siltsack, place unit where the contents will be collected. Place the rebar through the lift straps (connected to the bottom of the sack) and lift. This will lift Siltsack from the bottom and empty the contents. Clean out and rinse. Return Siltsack to its original shape and place back in basin.

3.2 MAINTENANCE AND CLEANING

A. General: All temporary erosion and sedimentation control devices shall be maintained and cleaned as required from the time of their installation until their final removal. Permanent erosion control devices shall be maintained and cleaned as required until their final acceptance.

B. Erosion Control Supervisor:

1. The Contractor shall name one (1) individual as his sediment and erosion control supervisor whose responsibility will be maintenance and repair of all on-site erosion control measures. He will keep a daily log of his activities and an updated schedule of proposed construction activities. The log shall be made available to the local authority as well as any State/ Federal Inspectors.

C. Silt Fences: Remove silt as required maintaining the integrity of silt fences. If required, remove the silt fence completely and remove all accumulated silt, then reinstall.

D. Silt Sacks: Remove silt as required, maintaining the integrity of silt sacks.

3.3 ADJUSTMENTS AND CLEANUP

1. At the end of construction and after project areas have been stabilized with vegetation or other permanent site improvements as noted on the drawings, remove and legally dispose of, off site, all non-permanent erosion control devices and restore the damaged areas. Leave the site neat and clean.

END OF SECTION 312500

SECTION 321216 - ASPHALT PAVING

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. Hot-mix asphalt paving.

B. Related Requirements:

1. Section 312000 “Earth Moving” for subbase, base course and testing requirements.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Job-Mix Designs: For each job mix proposed for the Work.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the CT DOT.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 40 deg F.
2. Asphalt Surface Course: Minimum surface temperature of 40 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692/D 692M, sound; 3/4" angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242/D 242M, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Surface Course: Class 2 – Conform to M.04 of 816.

B. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Joint Sealant: ASTM D 6690, hot-applied, single-component, polymer-modified bituminous sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

3.3 SURFACE PREPARATION

A. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

3.4 PLACING HOT-MIX ASPHALT

A. Conform to Article 4.06.03 of Form 817.

B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt surface course in single lift.
2. Spread mix at a minimum temperature of 250 deg F.
3. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
4. Hand tamp and bevel edges of pavement. Raveled edges will be rejected.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time.
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927, but not less than 94 percent or greater than 100 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/16” (Sidewalks)

3.8 SIDEWALKS

A. Placing Bituminous Concrete: The bituminous concrete walk surface shall be laid in a single course.

B. Spreading Mixture. The mixture shall be dumped, as needed, in wheelbarrows or an approved steel dump sheet outside the areas in which it is to be placed. It shall then be immediately distributed into place by means of shovels and raked into a uniformly loose layer to the full width required and of such depth that, when the work is completed, it shall conform to the grade and surface contour required.

C. Rolling. The surface shall be rolled with self-propelled, tandem roller weighing not less than 1 - 1/2 tons and not more than 5 tons. In places inaccessible to a power roller, compaction shall be obtained by means of mechanical rammers or by hand tampers weighing not less than 50 pounds and having a tamping face not exceeding 100 square inches.

D. Testing Surface. When tested with a 10-foot straightedge placed parallel to the centerline of the courses, there shall be no deviation from a true surface in excess of ¼ of an inch.

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

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 REFERENCES

A. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

B. ASTM C 94/C 94M" -Standard Specification for ready Mixed Concrete.

1.3 SUMMARY

A. Section Includes Concrete Paving.

1. Walks and pavements.

B. Related Requirements:

1. Section 312000 "Earth Moving" for subgrade preparation, grading, & subbase course.
2. Section 033000 "Cast-in-place-Concrete" for site footings.

1.4 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

    a. Contractor's superintendent.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Ready-mix concrete manufacturer.
    d. Concrete paving Subcontractor.
    e. Manufacturer's representative of stamped concrete paving system used for stamped detectable warnings.

1.6 SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.7 INFORMATIONAL SUBMITTALS

A. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Joint fillers.

1.8 QUALITY ASSURANCE

A. Ready-Mix-Concrete 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" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches by 96 inches. Include full-size detectable warning.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

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 design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms**,** steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, fabricated from galvanized steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

C. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 deformed bars.

D. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars galvanized after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Generally conform to Form 817, M.03.01 class F and ASTM C94.

B. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150/C 150M, gray portland cement Type II.
2. Fly Ash: ASTM C 618, Class F.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4-inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Vapor Lock 20/21 Exterior Protection Concrete – ASTM C494 Type S admixture shall be added to all concrete.

E. Water: Potable and complying with ASTM C 94/C 94M.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Joint Sealer: ASTM C 920, Compatible with filler strips, two component polyurethane elastomeric type complying with FS-TT-S-00227, self-leveling and non-sag, designed for pedestrian and vehicular traffic as manufactured by Sika, Percora, or approved equal.

1. Type and grade: M (multi component) and P (non-sag).
2. Class: 25.
3. Backer Rod: ASTM C1330, Polyurethane based, closed cell type

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Dowel Sleeve – Speed load sleeve as manufactured by Sika Greenstreak.

E. Concrete Sealer – Saltguard as manufactured by Prosoco.

2.7 STAMPED DETECTABLE WARNING MATERIALS

A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome.

2.8 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 15 percent.
2. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 15 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 6 percent plus or minus 1-1/2 percent for 3/4-inch nominal maximum aggregate size.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use Water-Reducing Admixture: ASTM C 494, Type A, High-Range, Water-Reducing Admixture: ASTM C 494, Type F, Water-Reducing and Accelerating Admixture: ASTM C 494, Type E, or Water-Reducing and Retarding Admixture: ASTM C 494, Type D, in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

E. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4400 psi.
2. Maximum W/C Ratio at Point of Placement: 0.44.
3. Slump Limit: 4 inches.
4. Air entrainment: 6%.
5. Cementitious materials: 658 lb./c.y.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 de, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides 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.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, 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 reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges 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 paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Expansion Joints: Form expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints as noted.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
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. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction 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.

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius.

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: After initial floating, tool edges of paving and joints in concrete with an edging tool to a 1/4-inch radius.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation**,** steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

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 according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart 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 surface treatments.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed water sheen has disappeared and 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 power 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.

3.8 CONCRETE PROTECTION AND CURING

A. AIR CURING IS NOT ACCEPTABLE.

B. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

C. Comply with ACI 306.1 for cold-weather protection.

D. 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 manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

E. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

F. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing or curing compound 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, 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 occurring during installation or curing period, using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

G. Sealer: Apply “Salt Guard” according to manufacturer’s recommendations. Apply after concrete has cured for a minimum of 14 days.

H. Concrete must cure for 30 days minimum prior to freezing temperatures. If freezing temperatures are predicted prior to 30-day cure time, concrete must be protected with insulated blankets.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8-inch, minus 1/4 inch.
3. Surface: Gap below 10-feet long; unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 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/C 143M; 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/C 231M, pressure method; 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/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if 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.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. 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.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

E. Fill all stress cracks with concrete joint filler.

END OF SECTION 321313

SECTION 323113 - CHAIN LINK FENCES AND GATES

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.

B. Form 818: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

1.2 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Swing gates.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for cast-in-place concrete post footings.

C. References

1. ASTM A392 Specification for Zinc-Coated Steel Chain-Link Fence Fabric
2. ASTM A491 Specification for Aluminum-Coated Steel Chain-Link Fabric
3. ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
4. ASTM A824 Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link
5. ASTM F552 Standard Terminology Relating to Chain Link Fencing
6. ASTM F567 Standard Practice for Installation of Chain Link Fence
7. ASTM F626 Specification for Fence Fittings
8. ASTM F668 Specification for Polymer Coated Chain Link Fence Fabric
9. ASTM F900 Specification for Industrial and Commercial Swing Gates
10. ASTM F934 Specification for Standard Colors for Polymer-Coated Chain Link
11. ASTM F1043 Specification for Strength and Protective Coatings of Metal Industrial Chain Link Fence Framework
12. ASTM F1083 Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
13. ASTM F1184 Specification for Industrial and Commercial Horizontal Slide Gates
14. ASTM F1345 Specification for Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric
15. ASTM F1664 Specification for Poly (Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence

16. ASTM F1665 Specification for Poly (Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence
17. ASTM F2611 Standard Guide for the Design and Construction of Chain Link Security Fencing
18. CLFMI SFR 2445Security Fence Recommendations

1.3 SUBMITTALS

A. Product Data: For each type of product.

   a. Fence and gate posts, rails, and fittings.
   b. Chain-link fabric, reinforcements, and attachments.
   c. Gates and hardware.

B. Shop Drawings: For each type of fence and gate assembly.

   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Include accessories, hardware, gate operation, and operational clearances.

C. Samples for Verification: For each type of component with factory-applied finish,:
   1. Fabric
   2. Ties

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to set quality standards for fabrication and installation.

   1. Build mockup for typical chain-link fence and gate, including accessories.

1.5 FIELD 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.

B. When fence is adjacent to a property line, contractor shall establish and mark the line.

1.6 WARRANTY

A. Special Warranty: 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. Failure to comply with performance requirements.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

c. Faulty operation of gate operators and controls.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

2.2 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 according to "CLFMI Product Manual" and requirements indicated below:

1. Fabric Height: As indicated on Drawings.
2. Steel Wire for Fabric: 8 Gauge.

a. Mesh Size: 2 inches. NOTE: CHECK ASTM FOR MESH REQUIREMENTS FOR VARIOUS USES
a. Aluminum-Coated Fabric: ASTM A 491, Type I, 0.40 oz./sq. ft.
b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 2, 2.0 oz./sq. ft. with zinc coating applied before weaving.
c. Polymer-Coated Fabric: ASTM F 668, Class 2b over zinc -coated steel wire.

1) Color: Black, according to ASTM F 934.

d. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.

3. Selvage: Twisted and Knuckled at both selvages.

2.3 FENCE FRAMEWORK

A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 and CLFMI product manual based on the following:

1. Fence Height: As indicated on drawings.

2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.

a. Pipe size as indicated on drawings.

3. Metallic Coating for Steel Framework:

    a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A 123/A 123M.

4. Polymer coating over metallic coating.

    a. Color: Black, according to ASTM F 934.

2.4 SWING GATES

A. General: ASTM F 900 for gate posts and swing gate types.

1. Gate Leaf Width: As indicated on drawings.

B. Frame Corner Construction: Welded.

C. Hardware:

1. Hinges: Heavy Duty “Bull Dog” hinges, 360-degree inward and outward swing.
2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Keeper: Provide keeper for each gate leaf. Gate keeper shall consist of a mechanical device for securing the free end of the gate when in the open position.
4. Double gates: Provide drop rod to hold inactive leaf. Provide a gate stop to engage center drop rod. Provide a locking device and padlock eyes as an integral part of the latch.

2.5 FITTINGS

A. Provide fittings according to ASTM F 626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive 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 to posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches 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: According to ASTM F 626.

1. High Security Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

a. Polymer coating over metallic coating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a certified 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.

3.2 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. If the fence is adjacent to a property line, the line shall be staked by a licensed surveyor.

1. Clear the fence line of vegetation and debris.

3.3 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F 567 and CLFMI product manual.

1. Chain Link Fabric: Install fabric to outside of the framework. Attach fabric to the terminal post by threading the tension bar through the fabric; secure the tension bar to the terminal post with tension bands and 5/16 in. (7.94 mm) carriage bolts spaced no greater than 12 inches (304.8mm) on center. Chain link fabric to be sufficiently stretched taut so as not to deflect more than 3 in. (76 mm) in the center of line post at mid height subjected to a 30lb. (133N) horizontal force. Fabric to be secured to the line post with tie wires spaced no greater than 12 inches (304.8 mm) on center using pre-formed 9 gauge

galvanized steel power-fastened easy twist steel tie wire wrapped 360 degrees around the post or rail and fabric picket, twist the two wire ends together three full turns per ASTM F567. Excess wire shall be cut off and bent over to prevent injury.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

    a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.

E. Line Posts: Space line posts uniformly at 10 feet.

F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. 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. Locate horizontal braces at midheight of fabric 72 inches or higher. Install so posts are plumb when diagonal rod is under proper tension.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. 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: Secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2-inch bottom clearance 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. See 3.3 A-1 for additional information.

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 o.c.

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 360 degrees. Bend ends of wire to minimize hazard to individuals and clothing. See 3.3 A-1 for additional information.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 12 inches o.c.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.4 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.

3.5 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.

END OF SECTION 323113

SECTION 323300 - SITE FURNISHINGS

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. Foul-Pole.
2. Bases.
3. Fence Crown.
4. Pitching Rubber
5. Home Plate.
6. Scoreboard
7. Bleacher

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete footings.
2. Section 312000 "Earth Moving" for excavation for installing concrete footings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 FOUL-POLE

A. 12’-9” high foul pole with wing panel, #BBSBFP-12 (Custom), Jaypro Sports, Waterford, CT Ph. No. 800.243.0533 (www.jayprosports.com).

2.2 BASES

A. Model #RBBS-T for Little League, Rogers Base Company, Ph No. 800.829.7311 (www.rogersbreakawaybase.com). Base system to include base top, base plates and anchor systems.

2.3 FENCE CROWN

A. Safety Top Cap model # STC-8, color yellow, Jaypro Sports, Waterford, CT Ph. No. 200.243.0533 (www.jayprosports.com).

2.4 PITCHING RUBBER

A. Nail down pitching rubber model #RPP-NPP24. Pitching rubbers supplied by Rogers Base Company.

2.5 HOME PLATE

A. Rubber home plate, #HP-100, Jaypro Sports, Waterford, CT Ph. No. 800.243.0533 (www.jayprosports.com).

2.6 SCOREBOARD

A. Scoreboard Model 9214-C2 with custom sign and MS-250 control scoring console for baseball and softball, Spectrum Corporation, 10048 Easthaven Blvd., Houston, TX 77075 Ph No. 713.944.6200, 800.392.5050, Fax: 713.944.1290 (spectrumscoreboards.com)

2.7 BLEACHER

A. 4 Row Bleacher 15' Preferred Double Plank All Aluminum. Model BLDP-4AL, Jaypro Sports, Waterford, CT Ph. No. 800.243.0533 (www.jayprosports.com).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings 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 nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

END OF SECTION 323300

SECTION 328400 - PLANTING IRRIGATION

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. Piping.
2. Sprinklers and appurtenances.
3. Manual valves.
4. Automatic control valves.
5. Boxes for automatic control valves.
6. Automatic control system.
7. Water, power, and backflow are all existing.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

1.4 PERFORMANCE REQUIREMENTS

A. The purpose of this irrigation system specification is for an athletic field. This installation shall include, but not be limited to the following:

1. Existing water supply

2. Existing power supply

3. New sprinklers, valves, control systems, pipe and wire, all related appurtenances.

SUBMITTALS

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.

C. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

E. Qualification Data: For qualified Installer.

F. Field quality-control reports.

G. Operation and Maintenance Data: Include operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Provide proof of (3) similar projects.

B. 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.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Owner's written permission.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinklers: 2 extra of each.
2. Automatic Control Valves: 1 extra of each
3. Keys to controller cabinet: 2

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Soft Copper Tube: ASTM B 88, Type L, water tube, annealed temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

C. PVC Pipe: ASTM D 1785, PVC 1120 compound, SDR 21, Class 200.

1. PVC Socket Fittings: ASTM D 2466, Schedule 40.
2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.

2.2 PIPING JOINING MATERIALS

A. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 SLEEVING FOR PIPING

A. Standard: ASTM D 1785, SDR 21, Class 200 PVC Pipe.

2.4 MANUAL VALVES

A. Brass Gate Valves:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

a. American Valve, Inc.

b. American Granby
c. Aqua Valve Co.

3. Description:

a. Standard: MSS SP-80, Type 2.
b. Class: 125.
c. CWP Rating: 200 psig.
d. Body Material: ASTM B 62 brass with integral seat and screw-in bonnet.
e. Ends: Threaded or solder joint.
f. Stem: Brass, nonrising.
g. Disc: Solid wedge; brass
h. Packing: Asbestos free.
i. Handwheel: Malleable iron

2.5 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
   a. Hunter Industries Incorporated – ICV
   b. Rainbird Corporation – PESB
   c. Toro – P220

3. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.6 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.

B. Pressure Gages: ASME B40.1. Include 4-1/2-inch diameter dial, dial range of two times system operating pressure, and bottom outlet.

C. Pressure reducer, if required.

2.7 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Large Rotary Sprinklers:

1. Manufacturers: Subject to compliance with requirements.

2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
   a. Hunter Industries Incorporated – I25-04-SS.
   b. Rain Bird Corporation – Falcon SS.
   c. Toro Company (The); Irrigation Division – T7P.

3. Description:

   a. Body Material: ABS.
   b. Nozzle: Plastic
   c. Retraction Spring: Stainless steel.
   d. Internal Parts: Corrosion resistant.

4. Capacities and Characteristics:

   a. Flow: 3.8 to 31.5 GPM
   b. Pop-up Height: 4" aboveground to nozzle.
   c. Arc: 0 to 360 degrees.
   d. Radius: 40' to 67'
   e. Inlet: 1" IPS

2.8 CONTROLLERS

A. Manufacturers: Subject to compliance with requirements.

B. Basis-of-Design Product: Subject to compliance with requirements, or comparable product by one of the following:
   1. Hunter Industries Incorporated – I2C-800-PL w/ Modules.
   2. Rain Bird Corporation – ESPLXME.
   3. The Toro Co. - CC

C. Description:

   1. Controller Stations for Automatic Control Valves. Include switch for manual or automatic operation of each station.
   2. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and **two** matching keys; include provision for grounding.

      a. Body Material Molded plastic.
      b. Mounting: Surface type for wall.

   3. Control Transformer: 24-V secondary, with primary fuse.
   4. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.

      a. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.

b. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.
c. Surge Protection: Metal-oxide-varistor type on each station and primary power.

5. Rain shut off device.
6. Wiring: UL 493, Type UF #14/1 gauge, with solid-copper conductors; insulated cable; suitable for direct burial.
   a. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

2.9 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:

1. Manufacturers: Subject to compliance with requirements.

   a. Armorcast Products Company.
   b. Carson Industries LLC.
   c. NDS Pro

2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

   a. Size: As required for valves and service.
   b. Shape: Round, Square or Rectangular.
   c. Sidewall Material: PE.
   d. Cover Material: PE.

      1) Lettering: "VALVE BOX and IRRIGATION."

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 18 inches below finished grade
2. Circuit Piping: 12 inches
3. Sleeves: 24 inches

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install underground thermoplastic piping according to ASTM D 2774 and ASTM F 690.

G. Install expansion loops in control-valve boxes for plastic piping.

H. Lay piping on solid subbase, uniformly sloped without humps or depressions.

I. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

J. Install piping in sleeves under parking lots, roadways, and sidewalks.

K. Install sleeves made of Class 200 PVC pipe and socket fittings, and solvent-cemented joints.

L. Install transition fittings for plastic-to-metal pipe connections according to the following:

1. Underground Piping:

    a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
    b. NPS 2 and Larger: AWWA transition couplings.

2. Aboveground Piping:

    a. NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.
    b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Copper-Tubing Brazed Joints: Construct joints according to CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.

E. Copper-Tubing Soldered Joints: Apply ASTM B 813 water-flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B 32.

F. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

A. Install in underground piping in boxes for automatic control valves. Install DBY splice kits at each automatic control valve. Install a gate valve before each control valve. Fittings and nipples as required.

3.6 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights. Install on flexible swing joints.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install interior controllers on wall.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Install control cable in same trench as irrigation. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas. Use expansions loops, by wrapping around a 1" dowel 12" long, every 500'.

3.8 CONNECTIONS

A. Comply with requirements for piping specified in Division 22 Section "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Division 31 Section "Earth Moving" for warning tapes.

3.10 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Any irrigation product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Startup service shall be the responsibility of the irrigation installer.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

3.13 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

A. Train the Owner's maintenance personnel to adjust, operate, and maintain this system.

3.15 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Underground irrigation main piping:
   1. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

D. Underground Circuit piping,

   1. POLY pipe and insert & saddle fittings.

END OF SECTION 328400

SECTION 328400 - PLANTING IRRIGATION

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. Piping.
2. Sprinklers and appurtenances.
3. Manual valves.
4. Automatic control valves.
5. Boxes for automatic control valves.
6. Automatic control system.
7. Water, power, and backflow.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

1.4 PERFORMANCE REQUIREMENTS

A. The purpose of this irrigation system specification is for an athletic field. This installation shall include, but not be limited to the following:

1. New 2” water supply,

2. New power supply

3. New sprinklers, valves, control systems, pipe and wire, backflow prevention (as needed), and all related appurtenances.

SUBMITTALS

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.

C. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

E. Qualification Data: For qualified Installer.

F. Field quality-control reports.

G. Operation and Maintenance Data: Include operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Provide documentation with the bid of at least three projects of a similar nature. Provide a report with project name, location, and contact name with email or telephone.

B. 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.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify **Construction Manager** no fewer than **two** days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without C**onstruction Manager's** written permission.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinklers: 2 extra of each.
2. Automatic Control Valves: 1 extra of each
3. Keys to controller cabinet: 2

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Soft Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), water tube, annealed temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

C. PVC Pipe: ASTM D 1785, PVC 1120 compound, SDR 21, Class 200.

1. PVC Socket Fittings: ASTM D 2466, Schedule 40.
2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.

2.2 PIPING JOINING MATERIALS

A. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 SLEEVING FOR PIPING

A. Standard: ASTM D 1785, SDR 21, Class 200 PVC Pipe.

2.4 MANUAL VALVES

A. Brass Gate Valves:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

a. American Valve, Inc.
b. American Granby

c. Aqua Valve Co.

3. Description:

a. Standard: MSS SP-80, Type 2.
b. Class: 125.
c. CWP Rating: 200 psig (1380 kPa).
d. Body Material: ASTM B 62 brass with integral seat and screw-in bonnet.
e. Ends: Threaded or solder joint.
f. Stem: Brass, nonrising.
g. Disc: Solid wedge; brass
h. Packing: Asbestos free.
i. Handwheel: Malleable iron

2.5 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
   a. Hunter Industries Incorporated – ICV
   b. Rainbird Corporation – PESB
   c. Toro – P220

3. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.6 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.

B. Pressure Gages: ASME B40.1. Include 4-1/2-inch- (115-mm-) diameter dial, dial range of two times system operating pressure, and bottom outlet.

C. Pressure reducer, if required.

2.7 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Large Rotary Sprinklers:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
   a. Hunter Industries Incorporated – I25-04-SS.

b. Rain Bird Corporation – Falcon SS.
c. Toro Company (The); Irrigation Division – T7P.

3. Description:

a. Body Material: ABS.
b. Nozzle: Plastic
c. Retraction Spring: Stainless steel.
d. Internal Parts: Corrosion resistant.

4. Capacities and Characteristics:

a. Flow: 3.8 to 31.5 GPM
b. Pop-up Height: 4" aboveground to nozzle.
c. Arc: 0 to 360 degrees.
d. Radius: 40' to 67'
e. Inlet: 1" IPS

C. Medium Rotary Sprinklers:

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
a. Hunter Industries Incorporated – I-20SS.
b. Rain Bird Corporation – 5004PLSS.
c. Toro Company (The); Irrigation Division – T5SS.

3. Description:

a. Body Material: ABS.
b. Nozzle: Plastic
c. Retraction Spring: Stainless steel.
d. Internal Parts: Corrosion resistant.

4. Capacities and Characteristics:

a. Flow: 1.12 to 9.8 GPM
b. Pop-up Height: 4" aboveground to nozzle.
c. Arc: 0 to 360 degrees.
d. Radius: 29' to 46'
e. Inlet: 3/4" IPS

C. Spray Heads:

1. Manufacturers: Subject to compliance with requirements.

2. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

f. Hunter Industries Incorporated –PROS-04-PRS40.
g. Rainbird Corporation – 1804-SAM-PRS
h. Toro Co. – 570Z PRX 4”

5. Description:

a. Body Material: ABS.
b. Nozzle: Plastic, MP Rotator 2000, by Hunter Industries.
c. Retraction Spring: Stainless steel.
d. Internal Parts: Corrosion resistant.

6. Capacities and Characteristics:

a. Flow: .16 to 4.2 GPM
b. Pop-up Height: 4”.
c. Arc: 0 to 360 degrees.
d. Radius: 0’ to 30’
e. Inlet: 1/2” IPS

2.8 CONTROLLERS

A. Manufacturers: Subject to compliance with requirements.

B. Basis-of-Design Product: Subject to compliance with requirements, or comparable product by one of the following:
1. Hunter Industries Incorporated – ICC2.
2. Rain Bird Corporation – ESPLXME.
3. The Toro Co. - CC

C. Description:

1. Controller Stations for Automatic Control Valves. Include switch for manual or automatic operation of each station.
2. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and **two** matching keys; include provision for grounding.

a. Body Material **Molded plastic**.
b. Mounting: **Surface type for wall**.

3. Control Transformer: 24-V secondary, with primary fuse.
4. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.

a. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
b. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.

c. Surge Protection: Metal-oxide-varistor type on each station and primary power.

5. Rain shut off device.
6. Wiring: UL 493, Type UF #14/1 gauge, with solid-copper conductors; insulated cable; suitable for direct burial.
   a. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

2.9 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:

1. Manufacturers: Subject to compliance with requirements.

   a. Armorcast Products Company.
   b. Dura
   c. NDS Pro

2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

   a. Size: As required for valves and service.
   b. Shape: [**Round**] [**Square**] [**Rectangular**].
   c. Sidewall Material: **PE**.
   d. Cover Material: **PE**.

      1) Lettering: "[**VALVE BOX**] [**IRRIGATION**]."

2.10 BACKFLOW (by others)

1. Manufacturers: Subject to compliance with requirements.
   a. Conbraco (Febco)

2. Description: Backflow shall be a reduced pressure type..

   a. Size: 2”.
   b. Shape: inline or angle.
   c. Sidewall Material: **Brass or bronze**.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

B. Install warning tape directly above pressure piping, **12 inches b**elow finished grades, except 6 inches below subgrade under pavement and slabs.

C. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 18 **inches** below finished grade
2. Circuit Piping: 12 **inches**
3. Sleeves: **24 inches**

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install underground thermoplastic piping according to ASTM D 2774[**and ASTM F 690**].

G. Install expansion loops in control-valve boxes for plastic piping.

H. Lay piping on solid subbase, uniformly sloped without humps or depressions.

I. Install PVC piping in dry weather when temperature is above 40 deg F (5 deg C). Allow joints to cure at least 24 hours at temperatures above 40 deg F (5 deg C) before testing.

J. Install piping in sleeves under parking lots, roadways, and sidewalks.

K. Install sleeves made of Class 200 PVC pipe and socket fittings, and solvent-cemented joints.

L. Install transition fittings for plastic-to-metal pipe connections according to the following:

1. Underground Piping:

a. NPS 1-1/2 (DN 40) and Smaller: Plastic-to-metal transition fittings.
b. NPS 2 (DN 50) and Larger: AWWA transition couplings.

2. Aboveground Piping:

a. NPS 2 (DN 50) and Smaller: Plastic-to-metal transition [**fittings**] [**unions**].
b. NPS 2 (DN 50) and Larger: Use dielectric flange kits with one plastic flange.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Copper-Tubing Brazed Joints: Construct joints according to CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.

E. Copper-Tubing Soldered Joints: Apply ASTM B 813 water-flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B 32.

F. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

A. Install in underground piping in boxes for automatic control valves. Install DBY splice kits at each automatic control valve. Install a gate valve before each control valve. Fittings and nipples as required.

3.6 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights. Install on flexible swing joints.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches (100 mm) from walls and 2 inches (50 mm) from other boundaries unless otherwise indicated.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install interior controllers on **wall**.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Install control cable in same trench as irrigation. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas. Use expansions loops, by wrapping around a 1” dowel 12” long, every 500’.

3.8 CONNECTIONS

A. Comply with requirements for piping specified in Division 22 Section "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Division 31 Section "Earth Moving" for warning tapes.

3.10 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Any irrigation product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Startup service shall be the responsibility of the irrigation installer.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

3.13 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

A. Train the Owner's maintenance personnel to adjust, operate, and maintain this system.

3.15 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Underground irrigation main piping:
1. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

D. Underground Circuit piping,

1. POLY pipe and insert & saddle fittings.

END OF SECTION 328400

SECTION 329200 - TURF AND GRASSES

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. Hydroseeding.
2. Sodding.
3. Turf renovation.

B. Related Requirements:

1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.
2. Section 311000 “Site Clearing” for topsoil stripping and stockpiling.
3. Section 312000 “Earth Moving” for excavation, filling and backfilling, rough grading and topsoil.

1.3 REFERENCES

A. Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

1.4 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 312000 "Earth Moving" for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.5 SUBMITTALS

A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, 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.

1. Certification of each seed mixture. Include identification of source and name and telephone number of supplier.

B. Product Certificates: For fertilizers, from manufacturer.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the National Association of Landscape Professionals or AmericanHort.
2. Experience: Three years' experience in turf installation.
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the National Association of Landscape Professionals:

    a. Landscape Industry Certified Technician - Exterior.
    b. Landscape Industry Certified Lawn Care Manager.
    c. Landscape Industry Certified Lawn Care Technician.

5. Pesticide Applicator: State licensed, commercial.

B. Soil Analysis: For topsoil, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. Report suitability of tested soil for turf growth.

a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable turf.
b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: April 15th-June 15th.
2. Fall Planting: September 15th-October 15th.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species:

1. Quality: Seed of grass species as listed below with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed, available from SODCO:

a. 70 percent Tall Fescue.
b. 20 percent Bluegrass.
c. 10 percent Ryegrass.

2.2 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.

C. Mycorrizal Fungi: Comprehensive soil inoculant formulated for turf installations and maintenance. It contains a blend of VA mycorrhizal (VAM) fungi and rhizosphere bacteria selected for their beneficial activities in the rhizosphere of plants. Also contains Myconate (formononetin), a patented stimulant of VAM fungi to increase colonization rates of the grass roots.

1. Roots Turf Saver 3-4-3 or equal.

2.3 MULCHES

A. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.4 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install 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.

3.3 TURF AREA PREPARATION

A. Placing Planting Soil: Place planting soil over exposed subgrade.

1. Reduce elevation of planting soil to allow for soil thickness of sod.

B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, commercial fertilizer if required, lime if required, pre-emergent herbicide and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 25-lb/1,000 SF (40-lb/1,000 SF on slopes 2:1 or over) dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

    a. Seed: 5 lb/1,000 SF.
    b. Pre-emergent herbicide as recommended by manufacturer.

3.5 SODDING

A. Lay sod within 24 hours of harvesting unless a suitable preservation method is accepted by Landscape Architect prior to delivery time. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.6 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

I. Remove stones ½ inch or larger in any dimension, sticks, roots trash and other extraneous matter.

J. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

1. Soil Amendment(s): Apply soil amendments at the rate as recommended in soil reports.

K. Apply hydroseeding as required for new turf.

L. Water newly planted areas and keep moist until new turf is established.

3.7 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.

2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
4. Remove stones on surface ½ inch or larger in any dimension.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow to a height of 1-1/2 to 2 inches.

D. Turf Postfertilization: Apply commercial fertilizer after initial mowing and when grass is dry if required per soil reports.

3.8 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.9 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.11 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 60 days from date of Substantial Completion.

    a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 30 days from date of Substantial Completion.

END OF SECTION 329200

SECTION 329300 - PLANTS

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. Plants.
2. Maintenance.

B. Related Requirements:

1. Section 329200 "Turf and Grasses" for turf (lawn), hydroseeding, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

B. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

C. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

D. Finish Grade: Elevation of finished surface of planting soil.

E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

F. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

G. Planting Area: Areas to be planted.

H. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

I. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

J. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

K. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

L. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Topsoil test with recommendations.
2. Fertilizer and amendments if required per topsoil test
3. Plant list for conformation.
4. Plant tablets
5. Pre-emergent non-selective herbicide
6. Organic mulch.
7. Post-emergent selective herbicide

B. Material Test Reports: For existing on-site and manufactured topsoil with amendment recommendations for new planting beds.

C. Samples: For each of the following:

1. Organic Mulch: 1-pint volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each

Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation.
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:

    a. Landscape Industry Certified Technician - Exterior.
    b. Landscape Industry Certified Horticultural Technician.

5. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For topsoil, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. Report suitability of tested soil for plant growth.
    a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances is made by Landscape Architect, who tags plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Plant Material Observation: Landscape Architect to observe plant material at place of growth and at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Contractor shall locate all plant materials and be present for inspection at the nursery and on-site. Contractor shall make all pre-selection arrangements at the nursery to ensure an efficient selection procedure. Notify the Landscape Architect at least fourteen (14) days in advance of Contractor's desired inspection date.
2. If the growing site is located further than a two-hour drive (one way) from the Landscape Architect's office, the Contractor shall pay for the time and expenses incurred by the Landscape Architect when inspecting plants. Trees shall be tagged by the Landscape Architect prior to digging.
3. Notify the Landscape Architect at least five (5) working days in advance of delivery of plants to the site.
    a. Contractor shall schedule a time for on-site inspection prior to planting, and shall arrange for adequate labor and equipment on-site at the time of inspection to unload, open, and handle plants during inspection.
    b. The Landscape Architect will be the sole judge of the condition of the plants.

G. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide

protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

H. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Deciduous trees and shrubs:
   Spring: March 15 to May 15.
   Fall: September 15 to December 15.

2. Evergreen trees and shrubs:
   Spring: March 15 to May 15.
   Fall: September 1 to November 15.

3. Container-grown perennials, vines, and ground cover plants:
   Spring: March 15 to July 1.
   Fall: September 1 to November 1.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.9 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.

2. Warranty Periods: From date of Substantial Completion.

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
c. Annuals: Three months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.

2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

2.2 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Planting Packets: Comprehensive soil inoculant combining mycorrhizal fungi, beneficial rhizosphere bacteria and Myconate (formononetin), a naturally occurring isoflavone that increases root colonization by VA mycorrhizal (VAM) fungi. Also includes Roots PHC Terra-Sorb hydrogels to hold moisture in the root zone, humic acids and various microbial nutrients.

1. Roots Tree Saver or equal.

2.3 MULCHES

A. Shredding Bark Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Triple shredded hardwood.
2. Size Range: 3 inches maximum, 1/2 inch minimum.
3. Color: Natural.

2.4 PESTICIDES / HERBACIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer. Preen or equal

C. Post-Emergent Herbicide (Selective): Effective for controlling weed growth that has already germinated.

2.5 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install 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.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Landscape Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Thoroughly blend planting soil off-site before spreading.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

2. Spread planting soil to a depth of 18 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.

4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
9. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Backfill Soil: Subsoil and topsoil removed from excavations may not be used as part of backfill soil unless otherwise indicated.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
3. Place planting packets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place packets in bottom of the hole.

4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE, SHRUB AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.7 GROUND COVER PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.8 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness.
2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch. Do not place mulch within 3 inches of trunks or stems.

3.9 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.10 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.11 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Species of Replacement Trees: Species selected by Landscape Architect.

3.12 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.13 MAINTENANCE SERVICE

A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: 12 months from date of Substantial Completion.

END OF SECTION 329300

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. Perforated-wall pipe and fittings.
2. Drainage conduits.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Drainage conduits, including rated capacities.

PART 2 - PRODUCTS

2.1 PERFORATED-WALL PIPES AND FITTINGS

A. Perforated PE Pipe and Fittings:

1. NPS 6 (DN 150) and Smaller: ASTM F405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.3 FIELD DRAINAGE INSTALLATION

A. Provide trench width to allow installation of drainage conduit. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.

B. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.

C. Add drainage course to top of drainage conduits.

3.4 CONNECTIONS

A. Connect low elevations of subdrainage system to solid-wall-piping storm drainage system.

3.5 IDENTIFICATION

A. Arrange for installation of green warning tapes directly over piping. Comply with requirements for underground warning tapes specified in specified in Section 312000 "Earth Moving."

1. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.6 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.
2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

B. Drain piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.7 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600

PROJECT DRAWINGS w/STANDARD DETAILS