South Hadley Electric Light DEPARTMENT

INVITATION FOR BIDS - Bid # 2020-1A

South Hadley Electric Light Dept "SHELD" MLP
IFB for the SHELD Telecom Substation Improvements

The South Hadley Electric Light Department (SHELD), is soliciting bids for the SHELD Central Office construction and upgrades located at 128 College Street and 26 Old Lyman Road, South Hadley, MA. Sealed general bids will be received at the main office of the South Hadley Electric Light Department MLP, 85 Main Street, South Hadley, MA 01075, **until 2:00 p.m., Wednesday, August 5, 2020,** at which time and place said bids shall be publicly opened and read. No fax or electronic bids will be accepted. All bids must be clear and legible in order to be considered. Envelopes containing proposals should be clearly marked on the outside: **SHELD Telecom Substation Improvements for College Street and Old Lyman Road Locations**

Bidders must bid include both substation location packages as one completed proposal package.

Complete project information, plans, specifications and proposal forms may be obtained electronically either by contacting Kim Mendoza at kmendoza@sheld.org or by downloading from www.sheld.org, under "About", then "RFP and Specifications". If bidder cannot access the bid package electronically, a bid package can be requested by appointment only at the South Hadley Electric Light Department beginning Wednesday, July 15, 2020 between the hours of 9:00 am and 4:00 pm, Monday through Friday. A $300 document deposit, in the form of a business check payable to South Hadley Electric Light Dept, is required for the plans and specifications. Such deposit shall be refunded to bidders who return plans and specifications, in usable condition, within ten days following bid opening. Bidders requesting mailed document sets must provide a separate non-refundable $30 mailing fee in the form of a separate check payable to South Hadley Electric Light Dept.

The term of this contract will be for one (1) year, with an option for SHELD to renew the agreed upon contract items each year, not to exceed a total of (3) years.

Bids will be opened at the South Hadley Electric Light Department MLP, on **Wednesday, August 5, 2020 at 2:00 p.m. EST**. Each bid must be accompanied by a bid security deposit consisting of a BID BOND, CASH, or CERTIFIED CHECK issued by a responsible bank or trust company in the amount of 5% of the bid price.

Interested bidders must attend the mandatory **Pre-Bid Conference and Site Visit** to be held at the South Hadley Electric Light Department, 85 Main Street, South Hadley, MA **on Tuesday, July 21, 2020 at 9:00 a.m. EST.**

A labor and materials payment bond in an amount equal to 50% of the total amount of the contract price, with a surety company qualified to do business in the Commonwealth of Massachusetts, will be required.

All bids for this project are subject to applicable public bidding laws of Massachusetts, including but not limited to G.L. c. 30, section 39M.

Attention is directed to prevailing wage rates to be paid as determined by the Commissioner of Labor and Workforce Development and the weekly payroll record submittal requirements under the provisions of G. L. c. 149, section 26 through 27D inclusive.

Selection of the contractor will be based upon bidder qualifications, including evidence of past performance in similar projects and bid price. The contract will be awarded to the bidder deemed, by the awarding authority, to be the lowest qualified, responsible, and eligible bidder.

The bidder agrees that its bid shall be good and may not be withdrawn for a period of 60 days after the opening of the bids. The Bidder, by submitting a bid, agrees to execute the contract provided in the bid's documents in the same form as herein.

South Hadley Electric Light Dept "SHELD" MLP, reserves the right to wave any informalities, to accept or reject, in whole or in part any or all bids, or take whatever other action may be deemed to be in the best interest of South Hadley Electric Light Department.

Sean Fitzgerald, General Manager
South Hadley Electric Light Department
85 Main Street
South Hadley, MA 01075

South Hadley Electric Light
DEPARTMENT

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INVITATION FOR BIDS - Bid # 2020-1A

SOUTH HADLEY ELECTRIC LIGHT DEPT

SHELD TELECOM SUBSTATION IMPROVEMENTS

85 MAIN STREET

SOUTH HADLEY, MA 01075

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1 GENERAL INFORMATION AND INSTRUCTIONS TO BIDDERS

Bid #2020-1A – South Hadley Electric Light Dept Telecom Substation Improvements
The South Hadley Electric Light Department of South Hadley, Massachusetts is seeking bids from qualified contractors to complete work required for the SHELD Telecom Substation Improvements Project located at 128 College Street and 26 Old Lyman Road in South Hadley, Massachusetts.

The project includes furnishing all labor, equipment, and materials required to perform the SHELD Telecom Substation Improvements Project located on College Street, in South Hadley, Massachusetts. The project includes, but is not limited to excavation, trenching, conduit installations, grading, bollard installation, plantings, paving, concrete utility pad installation, fencing, adjusting utility frame and covers, unloading delivered precast concrete utility sheds, loading and transporting existing concrete utility shed from other site, porous asphalt installation, and incidental items as set forth in the specifications. The complete scope of work and contract requirements are described and detailed below and in the referenced material, the "Contract Documents."

The Contractor shall furnish all labor, services, materials, network equipment not supplied by SHELD, plant, machinery, apparatus, appliances, tools, supplies and other things necessary to do all work required for the completion of each item of the Work and the Project as herein specified.

The Work/Project to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of the Work or Project herein.

1.1 Bidders' Representation

1.1.1 Each General Bidder (hereinafter called "Bidder") by making a bid (hereinafter called "bid") represents that: Prior to the submission of its proposal, each Bidder shall assume the responsibility for making a careful examination of and becoming fully acquainted with all Contract Documents. The failure or omission by any Bidder to receive or examine any form, instrument, or document, or to visit the site of the work to be performed, to acquaint the Bidder with conditions there existing, shall in no way relieve any Bidder from its obligations with respect to its proposal and any resultant contract/purchase award. Bidder shall be required, at its own expense, to comply with all statutes, regulations, ordinances, and tests that may be applicable. Bidder shall be responsible for all SHELD attorneys' and experts' fees and expenses incurred in enforcing this paragraph.

1.2 Bidders' Qualification

1.2.1 Your attention is directed to the attached policy statement on the Minority Business Enterprise Program.

1.2.2 Your attention is directed to the payment of prevailing wage rates as set by the Massachusetts Department of Labor and Workforce Development. All bids are subject to prevailing wage and weekly reporting. Wage rates are subject to the minimum rates per MGL c. 149, sec 26 to 27h inclusive. These rates are included in the bid documents.

1.2.3 The Contractor shall provide worker's compensation insurance as required by Massachusetts Labor Laws and all other insurances as required herein.

1.3 Request for Interpretation

1.3.1 Bidder shall promptly notify South Hadley Electric Light Department (MLP) of any ambiguity, inconsistency or error which it may discover upon examination of the Contract Documents, the local conditions or site.

1.3.2 Bidders requiring clarification or interpretation of the Contract Documents shall make an electronic request to the MLP referencing the required section for clarification to the following address: kmendoza@sheld.org

SHELD, the MLP, will answer such requests if received at least THREE (3) calendar days before the date for receipt of the bids.

1.3.3 Any interpretation, correction or change in the Contract Documents shall be made by an Addendum, which will become part of the Contract Documents. SHELD, the MLP, will not be held responsible for any oral instruction.

1.3.4 Addenda will be electronically mailed by the MLP to every individual or firm on record as having requested a set of Contract Documents.

1.3.5 Failure of the MLP to send, or of any bidder to receive any such interpretation shall not relieve the bidder from any obligations under its bid as submitted and all addenda or interpretations shall become part of the Contract as if fully set forth herein.

1.4 Preparation of Bids

1.4.1 Bids shall be submitted as described in section 1.10. Please submit three (3) copies of the complete bid package forms.

1.4.2 Appropriate blanks on the bid form attachments shall be filled in by typewriting or manually in ink. Failure to fill in information may be regarded as no response and be cause for rejection of the bid.

1.4.3 Where so indicated, by the makeup of the bid form, sums shall be expressed in both words and figures. In case of discrepancy between the two, the written amount shall govern.

1.4.4 No internalizations, alterations, or erasures shall be made on the forms.

1.4.5 If additional space is required, it shall be so noted on the Bid Pricing Form (Proposal Form) and included as a supplement attached under the Bidder's letterhead. This attachment shall become part of the Proposal Form. Bids shall state a firm price for the materials, equipment, work and services specified in the Proposal Form not supplied by SHELD, in accordance with the Bid Documents. The MLP specifically reserves the right to reject any Proposal not submitted on the Proposal Form provided and/or not complying with these instructions.

1.4.6 In addition to the Proposal Form, each Bidder MUST submit the following:

a. Bidders Certification Requirement (statement)
b. Contractors Certification
c. Subcontractors Certification
d. Evidence of Insurance Form
e. Affirmative Action Plan
f. References from previous projects of the same size scope or larger

1.4.7 Any deviation from these specifications must be noted with the bid. The bidder shall provide a written basis why the deviation should be considered as acceptable.

1.4.7.1 Exception/Clarifications to Instructions

1.4.7.2 Exceptions/Clarification to Specification

1.5 Bid Deposit and 50% Payment Bond

1.5.1 A 5% Bid Deposit must accompany the bid submittal.

1.5.2 The successful bidder shall be required to furnish a 50% Payment Bond, from a Surety Company qualified to do business in the Commonwealth of Massachusetts, in the sum of fifty percent of the contract price and which is to be paid for by the Contractor

1.5.3 The bonds shall be executed by a surety company licensed by the Massachusetts State Division of Insurance, with South Hadley Electrical Light Department as the payee. The bond shall be filed through the General Manager within five (5) working days after receipt by the vendor of a copy of the fully executed Contract. (M.G.L. c.30, Section 39M).

1.6 Insurance

1.6.1 Insurance coverage shall be required as defined in the Contract Documents.

1.6.2 A Certificate of Insurance naming South Hadley Electric Light Department as "Additional Insured" on Contractor's Business, Automobile Liability and Commercial General Liability must accompany your executed contract, along with a "Waiver of Subrogation" in favor of SHELD.

1.7 Taxes

South Hadley Electric Light Department is exempt from Sales Tax. A certificate of tax exemption will be provided after award to the awarded Contractor.

1.8 Hourly Prices (Where Requested)

1.8.1 Each Bidder shall insert the pricing requested on the bid forms in the appropriate location.

By submitting a Bid, the bidder agrees that the bidder's overhead and profit are included and form a part of the price.

1.8.2 The MLP reserves the right to increase or decrease the amount of any class or portion of the work to any location in the project, as may be deemed necessary or expedient by SHELD, the MLP.

1.8.3 An increase or decrease in the quantity for any item shall not be regarded as cause for an increase or decrease in the price, or in the time allowed for the completion of the work, except as provided in the contract.

1.9 Indemnification

The Contractor shall indemnify, defend and hold harmless the MLP and its governing board, officers and employees from all claims, expenses and liability related to construction, use, occupancy, ownership, operation, maintenance or control of facilities related to services to be performed under this agreement, including without limitation all SHELD attorneys' and experts' fees and

expenses.

1.10 Submission of Bids

The following list or requirements shall apply to each filed bid. Bids not meeting all of the requirements for timeliness and security will be rejected; bids not meeting signature and addenda requirements will be rejected prior to checking of bid amounts.

1.10.1 Three (3) copies of the General Bid shall be submitted in a sealed envelope to:

South Hadley Electric Light Dept
BID # 2020-1A SHELD Telecom Substation Improvements
for College Street and Old Lyman Road Locations
85 Main Street
South Hadley, MA 01075

1.10.2 Bids must be received **no later than 2:00 p.m. (Two O'clock) on August 5, 2020 EST**.

1.10.3 Timely delivery of a bid shall be the full responsibility of the bidder.

1.10.4 Bid signatures will be checked. Bids received after the time specified above will not be accepted or considered.

Any bidder may modify his bid by written communication at any time prior to the scheduled closing time for receipt of bids. No telegraphic communication will be received by the Owner.

Laws and Regulations: The bidder's attention is directed to the fact that all applicable federal laws, State laws, municipal bylaws, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout and they will be deemed to be included in the Contract the same as though written out in full.

By signing the Bid, the Bidder agrees to execute the Contract with the Owner in the same form as submitted herein.

Liquidated Damages for Failure to Enter into Contract: The successful bidder, upon its failure or refusal to execute and deliver the Contract and bonds required within 10 days after presentation thereof by the Owner, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with its bid,. In case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder, its bid deposit will be returned.

Obligation of Bidder: At the time of the opening of bids, each bidder must have inspected the site and read and be thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect of its bid.

Information not Guaranteed: All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, conduits and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, conduits or other structures encounter during construction will be the same as those indicated in the Contract Documents. It is further agreed and understood that no bidder or Contractor shall use or be entitled to use any of the information made available to it or obtained in any examination made by it in any manner as a basis of or ground for any claim or demand against the Owner or the Designer, arising from or by reason of any variance which may exist between information made available and the actual subsurface or other structures actually encountered during the installation work.

Bid Security: Each bid and sub-bid must be accompanied by bid security in the form of a certified check, a bid bond, cash or a treasurer's or cashier's check, payable to the Owner, in the amount of five (5%) per cent of the value of the bid. Such security of general bidders will be returned to all except the three lowest qualified, responsible and eligible bidders within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids, and the remaining securities will be returned promptly after the Owner and the accepted bidder have executed the Contract, or if no notice of intent to award has been presented to the selected contractor within 30 days, Saturdays, Sundays and holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

Right to Reject Bid: The Owner reserves the right to waive any informalities in bids and to reject any and all bids should the Owner deem it to be in the public interest to do so.

The Owner may also reject bids in its sole judgment.

Statutes Regulating Competitive Bidding: Any bid which does not comply with the provisions of G.L. c. 30, section 39M as amended, will not be accepted and the Owner will reject every such bid.

Wage Rates: Prevailing Wage Rates as determined by the Commission of Department of Labor and Workforce Development under the provision of G. L. c. 149, section 26 to 27G inclusive, as amended, apply to this project. It is the responsibility of the bidder, before bid opening, to request any additional information on Prevailing Wage Rates for those tradespeople who may be employed for the proposed work under this contract.

Contractor Records: The Contractor shall comply with the provisions of G.L. c. 30, section 39R concerning Contractor records.

Insurance: The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified in the Contract and in such form as shall protect

its performing work covered by this Contract, and SHELD and its employees, agents and officials from all claims and liability for damages for bodily injury, including accidental death and for property damage, which may arise from operations under this Contract. SHELD shall be named as an "Additional Insured", along with a "Waiver of Subrogation" in favor of SHELD. Contractor covenants and agrees to hold SHELD and its employees, agents and officials harmless from loss or damage due to claims for bodily injury or deal and/or property damage arising from, or in connection with, operations under this Contract, including without limitation all SHELD attorneys' and experts' fees and expenses.

1.11 Withdrawal of Bids

1.11.1 Any bid may be withdrawn prior to the time designated for the receipt of bids.

1.11.2 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids.

1.11.3 Each bid submitted at the time designated for the receipt of bids shall be valid for a time period of sixty (60) days.

1.12 Award

1.12.1 The Contract will be awarded to the lowest qualified, responsive/responsible and eligible bidder.

1.12.2 The SHELD MLP reserves the right to reject any or all bids, or to accept any bid that, in the sole opinion of the MLP, may be in the best interest of SHELD.

1.12.3 As used herein, the term "lowest qualified, responsive/responsible and eligible bidder" shall mean the General Bidder whose bid is the lowest of those Bidders possessing the skill, ability and integrity necessary to the faithful performance of the work and who shall certify that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work.

1.12.4 The lowest proposed "Total Bid Price" will be used to select the winning bid, but the actual final Contract Price will be determined by exactly how many services get requested and installed. The Bid Pricing Form is based on a 100% subscription rate, but it might actually be as much as 20% lower than that if not all residents take service. **The actual final Contract Price will therefore be somewhat lower than the Contractor's proposed Bid Price,** but it will be based on the Contractor's **unit pricing** to precisely determine the total amount to be paid.

1.13 Pre-Bid Conference

Mandatory Pre-Bid Conference will be held Tuesday, July 21, at 9:00 a.m. (Nine O'clock) at the South Hadley Electric Light Dept, 85 Main Street, South Hadley MA 01075.

2 SCOPE OF SERVICES AND QUALITY REQUIREMENTS

2.1 Project Overview

Work under this contract includes upgrades to SHELD Substations to support continued expansion of the Fibersonic Fiber network. The following is a summary of the proposed scope of work. The contractor shall refer to the technical specifications and project plans for details regarding the proposed work.

2.2 Scope of Work Summary

2.2.1 The Contractor shall be responsible for work consisting of the demolition and site clearing of site improvements as indicted on the project drawings.

2.2.2 The Contractor shall be responsible for site improvements including communication, electric, and gas utility trenching and backfilling; installation of hand holes and vaults; adjustment of frames and covers; foundation/footings for prefabricated utility sheds; porous pavement; concrete pads, bollard, grading; washed crushed stone; guide rail modifications; chain link fence and gates; and plantings.

2.2.3 The Contractor shall be responsible for procuring and installing prefabricated concrete utility sheds and the relocation and transport of Unit #2 to the Old Lyman Road site.

2.2.4 The Contractor shall be responsible for site restoration will include the complete removal of all debris, and grading and surface treatments as shown on the project plans.

2.2.5 The Owner shall be responsible for providing and installing communication conduit, electrical conduit, and vaults.

2.2.6 The Owner shall be responsible for providing gate card reader and pedestal.

2.2.7 **ADDITIONAL REQUIREMENTS**

i. All installations shall be neat, tidy, secure, and robustly serviceable, with **professional workmanship** and comply with generally observed “best practices”.

ii. Installation must comply with all applicable or relevant Local, State and Federal Codes and Contract Requirements.

2.3 Pricing

Bid must be filled out **COMPLETELY**. All fields requiring Hourly Pricing, Unit Pricing, Lump Sum, etc. must be complete. All titles listed must be used in proposal and in billing once the bid is awarded. All response sheets must not be altered, only forms supplied by or on behalf of the MLP will be accepted and evaluated with the bid proposal.

2.3.1 Work Week

Normal work week will be forty hours. The work week may include any combinations of hours with the most common being:

4 - 10 hour days or 5 - 8 hour days

2.4 Term of Contract

2.4.1 The term of this contract will be for one (1) year only, with the possibility of two 1 year extensions at the sole option of Owner.

2.5 MATERIALS SPECIFICATIONS

All Materials not provided by SHELD, will be approved by SHELD and provided by the Contractor. Technical specifications are included as part of this bid package.

3 BID PRICING SHEETS

Please submit three (3) copies of the complete bid package pricing sheets

SHELD - Telecom Substation Improvements at College Street				
ITEM NO.	ITEM	**Est Qty**	**Unit**	**Unit Cost**
1	Lump sum for SITE WORK	1	LS	
2	Lump sum for TELECOM SHELTER – PRECAST CONCRETE BUILDING	1	LS	
	OSP Instructions / Notes: **Bids must be submitted with line item pricing and all subject to the contract bid requirements.**			
	Item 1 – Site Work			
1	Description: Measurement for Site Work shall be on a lump sum according to Divisions 1 through Division 32.			
2	Unit of Measurement: Measurement of Site Work shall be on a lump basis. Payment of the bid price for Site Work shall be full compensation for the following work:			
	a. Temporary soil erosion and sediment control;			
	b. Protecting site features and furnishings to remain;			
	c. Excavation and trenching;			
	d. Grading and compacting driveway and stone area with crushed wash stone;			
	e. Transformer and equipment pad installation;			
	f. Unloading prefabricated concrete utility sheds.			
	g. Porous pavement and asphalt driveway aprons installation;			
	h. Installation of site furnishings including bollards, plantings, guiderail approach, and chain link fence with barbwire and gates;			
	i. Removing and disposing of material;			
	j. Restoring site and removing sediment controls once stabilized.			
	Item 2- UTILITY SHEDS			
1	Description: Measurement for the Utility Shed shall be on a lump sum basis and in accordance with Attachment D Pre-Cast Concrete Building Information.			
2	Unit of Measurement: Measurement of Utility Shed shall be on a lump sum basis. Payment of the bid price for the Utility Shed shall be full compensation for all the work described in Attachment D Pre-Cast Concrete Building Information including transportation and delivery of prefabricated concrete utility shed, including all labor equipment and materials required for or incidental to work. This work does include the unloading and placement by crane of the Utility Shed / Pre-Cast Concrete building once delivered to the site to be installed on foundation. (must include any necessary permitting and police details)			

SHELD - Telecom Substation Improvements at Old Lyman Road				
ITEM NO.	ITEM	**Est Qty**	**Unit**	**Unit Cost**
1	Lump sum for SITE WORK	1	LS	
2	Lump sum for TELECOM SHELTER – PRECAST CONCRETE BUILDING	1	LS	
	OSP Instructions / Notes: **Bids must be submitted with line item pricing and all subject to the contract bid requirements.**			
	Item 1 – Site Work			
1	Description: Measurement for Site Work shall be on a lump sum according to Divisions 1 through Division 32.			
2	Unit of Measurement: Measurement of Site Work shall be on a lump basis. Payment of the bid price for Site Work shall be full compensation for the following work:			
	k. Temporary soil erosion and sediment control;			
	l. Protecting site features and furnishings to remain;			
	m. Excavation and trenching;			
	n. Grading and compacting driveway and stone area with crushed wash stone;			
	o. Transformer and equipment pad installation;			
	p. Unloading prefabricated concrete utility sheds.			
	q. Porous pavement and asphalt driveway aprons installation;			
	r. Installation of site furnishings including bollards, plantings, guiderail approach, and chain link fence with barbwire and gates;			
	s. Removing and disposing of material;			
	t. Restoring site and removing sediment controls once stabilized.			
	Item 2- UTILITY SHEDS			
1	Description: Measurement for the Utility Shed shall be on a lump sum basis and in accordance with Attachment D Pre-Cast Concrete Building Information.			
2	Unit of Measurement: Measurement of Utility Shed shall be on a lump sum basis. Payment of the bid price for the Utility Shed shall be full compensation for all the work described in Attachment D Pre-Cast Concrete Building Information including transportation and delivery of prefabricated concrete utility shed, including all labor equipment and materials required for or incidental to work. This work does include the removal of Unit #2 by crane from the Stonybrook location to be installed in the Old Lyman Road location per print. This work does also include the unloading and placement by crane of the Utility Shed / Pre-Cast Concrete building once delivered to the site and to be installed on foundation. (must include any necessary permitting and police details)			

4 CERTIFICATION OF PRIME/SUB CONTRACTOR FOR CONSIDERATION OF ELIGIBILITY

REQUIRED TO BE RETURNED WITH YOUR BID

Please submit three (3) copies of the complete bid package forms

4.1 Bidders' Certification Requirement

The bidder hereby certifies that it shall comply with the minority manpower ratio and specific action steps contained in the Supplemental EEO Anti-Discrimination & Affirmative Action Plan attached hereto, including compliance with the minority contractor compliance specified in Section V of said Supplement. The contractor receiving the award of the contract shall be required to obtain from each of its subcontractors and submit to the contracting or administering agency prior to the performance of any work under said subcontractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in the Appendix EEO.

TAX CERTIFICATION – MASS. G.L.C. 62 C s. 49A

I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

_____

Print- Name of person signing bid | Signature

_____

Company | Title

_____

Street Address | City, State, Zip Code

4.2 Contractors' Certification

A contractor will be not eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTORS' CERTIFICATION

_____certifies that:
Contractor

Contractor tends to use the following listed construction trades in the work under the contract Site

- ☐ Clearing and Demolition
- ☐ Site Work
- ☐ Utility Construction
- ☐ Site Restoration and Paving
- ☐ Pre-Cast Concrete Shed Installation

; and

Will comply with the minority manpower ratio and specific affirmative action steps contained herein; *and*

Will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract certification required by these bid conditions.

_____

(Signature and title of authorized representative of contractor)

4.3 Subcontractors' Certification

*Required to be returned with your bid if a sub-contractor will be used on this project

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the Prime Contractor the following certification, which will be deemed a part of the resulting contract:

SUBCONTRACTORS' CERTIFICATION

_____certifies that:
Subcontractor

Subcontractor tends to use the following listed construction trades in the work under the contract

☐ Site Clearing and Demolition
☐ Site Work
☐ Utility Construction
☐ Site Restoration and Paving
☐ Pre-Cast Concrete Shed Installation

; *and*

Will comply with the minority manpower ratio and specific affirmative action steps contained herein; *and*

Will obtain from each of its subcontractors, prior to the award of any subcontract under this subcontract, the subcontractor certification required by these bid conditions.

_____

(Signature and title of authorized representative of subcontractor)

In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, no signature shall be executed until an authorized representative of the Administrative Agency administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

4.4 Evidence of Insurance Coverage Form

C E R T I F I C A T E O F I N S U R A N C E

Contractor's Name:_____RE:_____

Address: _____

Bid Title: _____

Bid Date:_____

Signature:_____Tel. No.:_____

The South Hadley Electric Light Dept "SHELD" requires contractors with whom it does business to provide the MLP with a certificate of insurance evidencing their insurance coverages.

Please send a copy of this form to your insurance broker/agent or insurance company.

The following certificate MUST COMPLY with our insurance requirements, which are as follows:

Prior to the start of the Work, the Contractor shall procure and maintain in force Workers Compensation Insurance, Employers' Liability Insurance, Business Automobile Liability Insurance, Commercial General Liability Insurance (CGL), and Builder's Risk insurance. The CGL policy shall include coverage for liability arising from premises, operations, independent contractors, products- completed operations, personal injury and advertising injury, contractual liability, and broad form property damage. The primary CGL coverage and the Builder's risk policies shall also name SHELD as an "Additional Insured" on a primary basis for liability arising out of the Work, along with a "Waiver of Subrogation" in favor of SHELD. Upon execution of the Agreement, the Contractor shall provide the Owner with certificates of the insurance coverage required for all of the coverage herein specified. The Contractor's Employers' Liability, Business Automobile Liability, and Commercial General Liability policies, as required in this Subparagraph 10.3.1, shall be written with at least the following limits of liability, on an occurrence and primary, non- contributory, basis.

Employers' Liability Insurance

a.	$1,000,000	Bodily Injury by Accident Each Accident
b.	$1,000,000	Bodily Injury by Disease Policy Limit
c.	$1,000,000	Bodily Injury by Disease Each Employee

Business Automobile Liability Insurance

d.	$1,000,000	Each Accident

Commercial General Liability Insurance

e.	$1,000,000	Each Occurrence
f.	$5,000,000	General Aggregate
g.	$5,000,000	Products/Completed Operations Aggregate
h.	$1,000,000	Personal and Advertising Injury Limit

Builder's Risk Insurance

i.	$1,000,000	Each Occurrence

The comprehensive general liability insurance must also specify that its coverage will be "Primary" to the South Hadley Electric Light Dept "SHELD" for claims arising out of our contractual relationships.

The South Hadley Electric Light Dept "SHELD" MUST be named as "Additional Insured" on the comprehensive general liability, umbrella/excess liability and pollution liability insurance policies, along with a "Waiver of Subrogation" in favor of SHELD.

The certificate must evidence any dedicatees (other than auto physical damage deductibles) or self-insurance retentions that apply to all required insurance coverages.

The insurance companies underwriting all required coverages must maintain a Best's Rating of at least A-: Class V.

The cancellation clause of the certificate of insurance must read as follows: "Should any of the above described policies be cancelled, not renewed, change materially in amount of coverage or changed in insuring form, the issuing company will give 30 days prior written notice to the below named Additional Insured."

A COPY OF YOUR CERTIFICATE OF INSURANCE ATTACHED TO THIS FORM MUST ACCOMPANY YOUR BID RESPONSE.

5. ADDITIONAL BID REQUIREMENTS

REQUIRED TO BE RETURNED WITH YOUR BID

Please submit three (3) copies of the complete bid package forms

5.1 Requirements and Information

5.1.1 Introduction

Consideration of Eligibility as a Prime/Sub Contractor is required for projects put out to bid by the MLP South Hadley Electric Light Dept "SHELD". This application is only to be completed by bidders that wish to be considered as eligible prime/sub-contractors.

An Application for Eligibility is not required for:
Ordinary (non-filed) sub-bids

5.1.2 Requirements for Consideration

1. Your firm or principal must demonstrate proven experience of at least 10 years in the category of work for which consideration is sought under the described bid information.
2. You must provide proof of OSHA Approved Training.
3. Your firm must have an established bonding capacity with minimum single and aggregate project limits in excess of $1,000,000 and $5,000,000 with a surety that is licensed to do business in the Commonwealth of Massachusetts and is on the most recent list of approved sureties issued by the United States Department of the Treasury.
4. Your firm must be able to demonstrate its ability, through its Owner, Supervision, workforce, and equipment, to satisfactorily complete the work under this specification with regard to safety, productivity, quality, and customer service.

5.2 Application

In filling out this bid application, be sure to answer all questions and include all required information. **Failure to answer any question or comply with any directive contained in these forms may result in denial of certification.**

Please submit three (3) copies of the complete bid package forms

Check next to each item and ensure that the following are included:

- ☐ Application for Consideration (Section II).
- ☐ Copy of Current State Office of Minority and Women Business Assistance (SOMWBA) Certificate, if applicable (Section II (A)(4).
- ☐ Most recent Massachusetts Corporation Annual Report or Massachusetts Foreign Corporation Annual Report if an out of state firm (Section II (A)(8)) or LLC Annual Report if an LLC (Section II (A)(8)), and, for new applicants, please include Articles of Organization or Massachusetts Foreign Corporation Certificate if an out of state firm (Section II (A)(8)) or Certificate of Organization if a Limited Liability Company (LLC) (Section II (A)(8)).
- ☐ Resumes of all Principal and Supervisory Personnel (Section II (B)).
- ☐ Applicable licenses and certifications for any personnel anticipated to be used in the duration of this contract.
- ☐ Original letter from Bonding Agent or Surety Company addressed to the South Hadley Electric Light Dept "SHELD" confirming single project and aggregate limits in excess of $1,000,000, and the name of the surety (Section II (D)(1)).
- ☐ Most Recent Year Ending CPA-Reviewed or Audited Financial Statement (Section II (D)(2)).
- ☐ Workers Compensation Insurance Binder or Policy and verification of your firm's Experience Modification Rating (EMR) (Section II (D)(4)), if applicable.

DO NOT SUBMIT BINDERS OR INCLUDE SUPERFLUOUS MATERIALS

5.3 Bidder Background Information *Category Sheet*

Company Name: _____

Address: _____

Telephone: _____

Fax: _____

E-Mail Address: _____

Submitted by: _____

Date: _____

Check all categories of work from the list below for which you have had recent pertinent experience.

Categories of Work:

- ☐ Site Clearing and Demolition
- ☐ Site Work
- ☐ Utility Construction
- ☐ Site Restoration and Paving
- ☐ Pre-Cast Concrete Shed Installation

Describe the general character of work performed by your company.

_____

_____

_____

_____

Date received: _____

5.4 Historical Data/Organization

1. Indicate the exact name by which your firm is known:

2. How many years has your firm been in business under its present business name?

3. Indicate all other names by which your firm has been known and the length of time known by each name:

4. Is your firm currently certified by the state office of minority and women business assistance (SOMWBA) as an MBE, WBE, or MWBE? ☐ yes ☐ no
   If yes, please provide a copy of your firm's current SOMWBA certificate.

5. My firm is a: (check one)

   ☐ Corporation ☐ Limited Liability Company

   ☐ Sole Proprietorship ☐ Partnership ☐ Business Trust

If a corporation or LLC, list or enclose the following:

6. State of Incorporation:

7. Date of Incorporation:

8. Enclose your firm's most recent Massachusetts Corporation Annual Report or Massachusetts Foreign Corporation Annual Report if an out of state firm or LLC Annual Report if a Limited Liability Company (LLC). For new applicants, please include Articles of Organization or Massachusetts Foreign Corporation Certificate if an out of state firm or Certificate of Organization if an LLC.

If a sole proprietorship, partnership, or business trust list or enclose the following:

9. Name of proprietor, principal partners, or principal officers:

10. State in which organized:

11. Date business was initiated/organized:

12. Type of partnership (e.g. 50/50, etc.):

13. If a sole proprietorship, include a copy of business certificate as filed with town clerk of town where business is located.

14. If a partnership, include a copy of business certificate as filed with the clerk of the city or town where partnership is located. Also, attach a copy of the partnership's articles of formation or partnership agreement.
15. If a business trust, include a copy of declaration of business as filed with the secretary of the commonwealth.

5.4.1 Personnel

Enclose resumes of all officers, partners, principal individuals and other key personnel in your firm. Information must include:

i. educational background
ii. construction experience
iii. number of years with this firm
iv. names of all other firms in which the individual now has or has in the past had a financial interest or decision-making responsibility.
v. licenses held - individual and corporate (attach copies)

5.4.2 Organizational Experience

1. List all trades in which your firm customarily engages with its own employees:
2. What percentage of work does your firm customarily perform with its own employees?

5.4.3 Bonding, Financial Data, and Workers' Compensation

1. Attach an original letter from your bonding agent addressed to The South Hadley Electric Light Dept "SHELD", confirming single and aggregate limits and providing name of Surety Company. The single and aggregate limits must be in excess of $100,000. Please note: the surety company must be licensed to issue bonding in the Commonwealth of Massachusetts by the Division of Insurance and must be on the most recent list of approved sureties issued by the United States Department of the Treasury.

2. Attach the most recent, complete year-ending **reviewed** or **audited** statement of financial condition prepared by a certified public accountant (CPA), including balance sheet, income statement, statement of cash flows, notes, and the most recent CPA-prepared mid-year financial statement. **Year-ending CPA-compiled statements are not acceptable**; however, mid-year statements may be CPA-compiled. Applicants that have parent companies, affiliates, or subsidiaries must provide a stand-alone financial statement that pertains solely to the applicant; in such cases if no CPA-reviewed or CPA- audited financial statement is available, the applicant may provide an in-house generated report, provided it includes a balance sheet, statement of income, and reviewed or audited statement of the parent company.

3. State the highest dollar volume of all construction work you have completed during any twelve-month period within the past five years $_____. During what twelve-month period was this work completed?_____-_____. Attach a CPA-prepared document confirming this information. Note: in lieu of this information, you may use your CPA-prepared financial statement as confirmation.

4. Attach a copy of your firm's Workers Compensation Insurance policy or binder and please ensure that it indicates your firm's Experience Modification Rating (EMR).

5.4.4 Highest Value Projects Experience

Indicate the two highest value single similar contracts completed by your firm within the past five years including start and end dates, names, addresses, and telephone numbers of owners, designers, and general contractors (or their representatives). When listing requested Categories of Work, refer to categories from Section 5.3 of this application. If a contract included more than one Category of Work for which your firm seeks eligibility, and the work was performed by your firm's own employees, please provide dollar breakdowns attributable to each category of work separately.

HIGHEST SINGLE PROJECT:

Project Title:_____

Enter all appropriate category(s) of work that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____ (City & State)_____
Start / End Dates:____/____ Owner:_____
Site Contact:_____ Site Contact Number:_____
Address:_____ Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____ Contact Number:_____
Address:_____ Email:_____
_____

SECOND HIGHEST PROJECT:

Project Title:_____

Enter all appropriate category(s) of work that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____ (City & State)_____
Start / End Dates:____/____ Owner:_____
Site Contact:_____ Site Contact Number:_____
Address:_____ Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____ Contact Number:_____
Address:_____ Email:_____
_____

5.4.5 Projects in Progress

List the contracts your firm has on hand stating for each contract: name and address of the client and name of the person supervision for the client; contract value; the start and stop dates.

PROJECTS IN PROGRESS: Sample Form

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____(City & State)_____
Start / End Dates:____/_____Owner:_____
Site Contact:_____Site Contact Number:_____
Address:_____Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____Contact Number:_____
Address:_____Email:_____

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____(City & State)_____
Start / End Dates:____/_____Owner:_____
Site Contact:_____Site Contact Number:_____
Address:_____Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____Contact Number:_____
Address:_____Email:_____

PROJECTS IN PROGRESS: Sample Form

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____(City & State)_____
Start / End Dates:_____/_____Owner:_____
Site Contact:_____Site Contact Number:_____
Address:_____Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____Contact Number:_____
Address:_____Email:_____

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location:_____(City & State)_____
Start / End Dates:_____/_____Owner:_____
Site Contact:_____Site Contact Number:_____
Address:_____Email:_____
_____

Construction PM, GC or Engineer:_____
Contact:_____Contact Number:_____
Address:_____Email:_____

5.4.6 Completed Projects

List all similar construction projects having a value over $25,000, which your firm has completed within the past five years or the ten most recent projects completed within the past five years that were at least $25,000. Do not list projects with contract values less than $25,000. **Information on randomly selected projects is not acceptable.** Note: when listing requested Categories of Work, refer to categories from Section 5.3 of this application. List all relevant categories of work that your firm performed with its own employees for each project. With respect to single contracts involving multiple categories of work, **provide a dollar breakdown attributable to each category listed.** Attach additional sheets, if necessary.

COMPLETED PROJECTS: Sample Form

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location: _____ (City & State) _____
Start / End Dates: ____/____ Owner: _____
Site Contact: _____ Site Contact Number: _____
Address: _____ Email: _____
_____

Construction PM, GC or Engineer: _____
Contact: _____ Contact Number: _____
Address: _____ Email: _____

Project Title:_____

Enter all appropriate category(s) of work from page that apply and include a breakdown of each category:

Category 1)_____ $_____
Category 2)_____ $_____
Category 3)_____ $_____
Category 4)_____ $_____
Category 5)_____ $_____

Total Contract Amount $_____

Project Location: _____ (City & State) _____
Start / End Dates: ____/____ Owner: _____
Site Contact: _____ Site Contact Number: _____
Address: _____ Email: _____
_____

Construction PM, GC or Engineer: _____
Contact: _____ Contact Number: _____
Address: _____ Email: _____

Regarding the information you supplied in Sections 5.2 and 5.3:

Is your firm or any individual who owns, manages or controls your firm affiliated with any owner, designer or general contractor named in Sections 5.2 and 5.3 either through a business or family relationship? (Check one) ☐ yes ☐ no

Are any of the contact persons named in Sections 5.2 and 5.3 affiliated with your firm or any individual who owns, manages or control your company, either through a business or family relationship? (Check one) ☐ yes ☐ no

If you have answered yes to either question, please explain. Attach additional sheets, if necessary.

5.4.7 General Performance

Answer the following questions by selecting YES or NO. Information is to cover the past five years prior to the date of submission of this application.

If you answer YES to any question, on a separate page provide a complete explanation. Include all details [project name(s) and location(s), names of all parties involved, relevant dates, etc.].

	YES	NO
1. Has your firm been terminated on any contract prior to completing a project or has any officer, partner or principal of your firm been an officer, partner or principal of another firm that was terminated or failed to complete a project?	☐	☐
2. Has your firm failed or refused either to perform or complete any of its work under any contract prior to substantial completion?	☐	☐
3. Has your firm failed or refused to complete any punch list work under any contract?	☐	☐
4. Has your firm filed for bankruptcy, or has any officer, principal or individual with a financial interest in your current firm been an officer, principal or individual with a financial interest in another firm that filed for bankruptcy?	☐	☐
5. Has your surety taken over or been asked to complete any of your work under any contract?	☐	☐
6. Has a payment or performance bond been invoked against your current firm, or has any officer, principal or individual with a financial interest in your current firm been an officer, principal or individual with a financial interest in another firm that had a payment or performance bond invoked?	☐	☐
7. Has your surety made payment to a materials supplier or other party under your payment bond on any contract?	☐	☐
8. Has any subcontractor filed a demand for direct payment with an awarding authority for a public project on any of your contracts?	☐	☐

	YES	NO
9. Have any of your subcontractors or suppliers filed litigation to enforce a mechanic's lien against property in connection with work performed or materials supplied under any of your contracts?	☐	☐
10. Have there been any deaths of an employee or others occurring in connection with any of your projects?	☐	☐
11. Has any employee or other person suffered an injury in connection with any of your projects resulting in their inability to return to work for a period in excess of one year?	☐	☐

5.4.8 Legal or Administrative Proceedings; Compliance with Laws

Please answer the following questions. Information is to cover all judicial and administrative proceedings arising prior to the date of submission of this application.
The term "administrative proceeding" as used in this application for certificate of eligibility includes (i) any action taken or proceeding brought by a governmental agency, department or officer to enforce any law, regulation, code, legal, or contractual requirement, except for those brought in state or federal courts, or (ii) any action taken by a governmental agency, department or officer imposing penalties, fines or other sanctions for failure to comply with any such legal or contractual requirement.

If you answer yes to any question, on a separate page provide a complete explanation of each proceeding or action and any judgment, decision, fine or other sanction or result. Include all details (name of court or administrative agency, title of case or proceeding, case number, date action was commenced, date judgment or decision was entered, fines or penalties imposed, etc.).

	YES	NO
1. Are there any judicial proceedings (other than criminal proceedings) pending or that have been concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to the procurement or performance of **any** construction contract, including but not limited to actions to obtain payment brought by subcontractors, suppliers or others?	☐	☐
2. Have any criminal proceedings been brought or have there been any convictions against your firm or a principal or officer or anyone with a financial interest in your firm relating to any of the following offenses: fraud, graft, embezzlement, forgery, bribery, falsification or destruction of records, receipt of stolen property, or environmental offenses?	☐	☐
3. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of state or federal procurement laws arising out of the submission of bids or proposals?	☐	☐
4. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of state or federal laws regulating campaign contributions?	☐	☐
5. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of chapter 268A of the Massachusetts General Laws?	☐	☐
6. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of any state or federal law regulating prevailing wages?	☐	☐

Legal or Administrative Proceedings; Compliance with Laws (continued)

	YES	NO
7. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of any state or federal law regulating hours of labor, unemployment compensation, minimum wages, overtime pay, equal pay, child labor or worker's compensation?	☐	☐
8. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a violation of any state or federal law prohibiting discrimination in employment?	☐	☐
9. Have any judicial or administrative proceedings been brought or concluded adversely against your firm or a principal or officer or anyone with a financial interest in your firm relating to a claim of repeated or aggravated violation of any state or federal law regulating labor relations or occupational health or safety?	☐	☐
10. Have any proceedings been brought by any municipal, state or federal agency to debar or suspend your firm or any principal or officer or anyone with a financial interest in your firm from public contracting?	☐	☐
11. Has your firm been denied certification, been decertified or debarred for any reason by any state or federal agency?	☐	☐
12. Has your firm been fined by OSHA or any other state or federal agency for violations of any laws or regulations related to occupational health or safety? Note: this information may be obtained from OSHA's Web Site at www.osha.gov	☐	☐
13. Has your firm been sanctioned for failure to achieve DBE/MBE/WBE goals, workforce goals, or failure to file certified payrolls on any public projects?	☐	☐

5.4.9 Certification (notarization required)

The undersigned_____hereby certifies:
(Print name)

That I am an owner or principal of_____,
(Company name)

and that all answers and all statements contained in the attached application for certificate of eligibility are true and correct. Providing false or misleading information or failure to provide all required information will be considered grounds for denial, decertification and/or debarment. I attest to the accuracy of all information contained in this application and verify that the information submitted is in fact accurate and true, under oath.

Signed and Sworn under the Pains and Penalties of Perjury. Dated at _____

This_____day of_____, 20____.

By (signature):

_____

Print name:_____

Title or position:_____

****

_____ss. _____.
(country) (state)

Before me,_____,
personally, appeared and (notary public)

known to me to be_____, based (name of officer) on satisfactory evidence which was his/her driver's license and acknowledged that he/she is authorized to execute the foregoing and that its execution is his/her free act and deed and the free act and deed of the firm.

_____ My commission

expires: _____(notary public signature)

_____

(print name)

Attachment A—(1) Certificate as to Corporate Bidder; (2) Certificate as to Payment of State Taxes; (3) Certificate of Non-collusion; and (4) Certificate of Fair labor practices

(1) CERTIFICATE AS TO CORPORATE BIDDER

I,_____certify that I am the _____ of the corporation named as Bidder in the Bid included herein, that_____, who signed said Bid on behalf of the Bidder was then_____of said corporation, that I know his signature, that his signature thereon is genuine and that said Bid was duly signed, sealed and executed for and in behalf of said corporation by authority of its governing body.

(Corporate Seal)

_____

(Secretary-Clerk)

Dated:_____

(2) CERTIFICATE AS TO PAYMENT OF STATE TAXES

Pursuant to M.G.L. Ch. 62C, sec. 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

_____ _____

Social Security Number or
Federal Identification Number

Signature of Individual or Corporate
Name

By:_____
Corporate Officer (if applicable)

(3) CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

_____
(Name of person signing bid or proposal)

_____
(Name of Business)

(4) CERTIFICATE OF FAIR LABOR PRACTICES

The undersigned certifies under penalties of perjury that in accordance with Section 504 of the (Federal) Rehabilitation Act of 1973 and 31 Code of Federal Regulations, Part 51, his/her company does not discriminate on its employment, procurement and marketing activities on the basis of race, creed, color national origin, sex, handicap or age.

_____
(Name of person signing bid or proposal)

_____
(Name of Business)

Attachment B - GENERAL SPECIFICATIONS

GENERAL REQUIREMENTS

1.1 PERMITS - Contractor shall obtain and track the status of all permits needed to construct the project. The Contractor shall work closely with the OWNER to determine the necessary Right of Entry and permits.

1.2 PROJECT MANAGER - for the Contractor shall be required to meet with each agency, along with representatives from the OWNER, and collect any necessary information from the agencies for design and permit submittal. These meetings will commence no later than two weeks after the "Notice to Proceed" is given to the Contractor.

1.3 REDLINE DRAWINGS - Contractor shall provide As-Built drawings in Portable Document Format (PDF) as well as 11x17 paper copies to the OWNER. The Contractor shall update actual construction progress as applicable on redline drawings during construction. Such drawings shall be available to the OWNER for review throughout the project.

DIGSAFE NOTIFICATIONS

Contractor will be responsible for all excavation pre-marking, coordination of affected facility owners as may be required and dig safe notifications. Contractor will be required to maintain markings throughout duration of project, and removal of all flag markings and removable marking materials upon completion of excavation.

POLICE DETAILS

Police details where required will be coordinated by CONTRACTOR. The OWNER Project Manager will work with contractor representative to determine where needed in advance of work commencement. Police detail billing will be direct to CONTRACTOR for this project is part of contractor scope. Please see Police Details Addendum.

AS-BUILT DOCUMENTATION

Contractor will provide all as-built documentation that details:

1. Final locations of all site improvements
2. Details of all conduits, wiring and underground utilities

RESTORATION

Restoration to all affected areas of construction shall be warranted as follows:
Grass and tree belt areas; period of 3 months in season, 6 months out of season Concrete; period of 6 months Asphalt; period of 12 months

Attachment C – Construction Specifications

Attachment D – Pre-Cast Concrete Building Information

Attachment E – State Prevailing Wage Rates

South Hadley Electric Light Department

College Street Construction Specifications – Attachment C1

Bid # 2020-1A

SHELD – Telecom Substation Improvements at College Street

BID SET

South Hadley Electric Light Department

South Hadley, Massachusetts

July 1, 2020

FUSS & O'NEILL

1550 Main Street, Suite 400
Springfield, MA 01003

TABLE OF CONTENTS

END OF SECTION

SECTION 00 01 15 – LIST OF DRAWINGS

C0.00 Cover Sheet

C1.00 Existing Conditions Plan

C1.10 Site Preparation & Demolition Plan

C1.20 Site Layout & Grading Plan

C1.30 Site Utility Plan

C3.00 Construction Details

END OF SECTION

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes furnishing, placing, and maintaining temporary sediment control measures as shown on the Drawings, as directed by the Engineer, and where necessary to reduce sediment content of runoff. Control measures are to remain in place until after completion of construction. Measures include the following:
   1. Construction entrance.
   2. Filter Fabric/Silt fence.
   3. Sediment Control bales.
   4. Catch basin inserts
   5. Dust control.
      a. Conduct construction operations and activities to minimize the creation and dispersion of dust. If the Engineer determines that water and or calcium chloride is required for more effective dust control, provide such measures at no additional cost.

B. Related Sections include the following:
   1. Section 31 10 00 Site Clearing
   2. Section 31 20 00 Earth Moving
   3. Section 32 92 19 Lawns and Grasses

1.2 SUBMITTALS

A. Product Data for the Following:
   1. Filter fabric and geotextiles for each application.
   2. Silt Fence
   3. Catch basin inserts

B. Certificates of Compliance:
   1. Filter fabric and geotextiles for each application.
   2. Catch basin inserts.
   3. Gravel base.
   4. Crushed stone.
   5. Calcium chloride.

C. Drawings
   1. Erosion Control Plan Showing all measures within the extent of work.

1.3 QUALITY ASSURANCE

A. Latest Version Standard Specifications: "The Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges" and supplements.

B. Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas" prepared by MADEP.

PART 2 - PRODUCTS

2.1 CONSTRUCTION ENTRANCE

A. Stone: Standard Specifications, Article M2.01.1.

B. Geotextile: Non-woven geotextile, conforming to the following.

2.2 FILTER FABRIC/SILT FENCE

A. Synthetic Filter Fabric: Woven geotextile, 36 inches maximum height, conforming to the following:

Properties	Requirement	Unit
Grab Tensile Strength (ASTM D4632):	124	Lbs
Grab Tensile Elongation (ASTM D4632):	15	Percent
Puncture Strength (ASTM D4833):	65	Lbs
Flow Rate (ASTM D4491):	20	Gal/Min/Sq. Ft.
UV Resistance(at 500 hours) (Retained strength) (ASTM D4355):	80	Percent

B. Product and Manufacturer:
1. ProPex 2130 by Amoco Fabrics and Fibers Company, Austell, GA.
2. Mutual MISF 1855 by Mutual Industries, Inc., Philadelphia, PA.
3. Or approved equal.

C. Posts
1. Hardwood Stakes: 2-inch by 2-inch by 54-inch minimum.

D. Silt Fence Fasteners: Staples, tie wires or hog rings, as recommended by manufacturer.
1. Staples: Heavy-duty wire, 1-inch long minimum.

2.3 SEDIMENT CONTROL BALES

A. Bale Material: Straw, bound by twine or wire, weighing 40 to 120 pounds per bale.

B. Hardwood Stakes: 2-inch by 2-inch by 36-inch minimum.

2.4 CATCH BASIN INSERTS

A. Regular Flow Silt Sacks: Woven polypropylene that meets the following:

Properties	Test Method	Units
Grab Tensile Strength	ASTM D4632	300 Lbs
Grab Tensile Elongation	ASTM D4632	25 Percent
Puncture Strength	ASTM D4833	120 Lbs
Trapezoid Tear	ASTM D4533	120 Lbs
Flow Rate	ASTM D4491	40 Gal/Min/Sq. Ft.
Permittivity	ASTM D4491	0.55 Sec-1
Mullen Burst	ASTM D3786	800 psi
UV Resistance(at 500 hours) (Retained strength)	ASTM D4355	80 Percent
Apparent Opening Size	ASTM D4751	#40 US Sieve

1. Manufacturer: ACF Environmental, 1801-A Willis Road, Richmond, VA 23237 (800-844-9223),
2. Or approved equal.

2.5 DUST CONTROL

A. Calcium Chloride: ASTM D98, Type 1 or Type 2.

B. Water: Potable.

PART 3 - EXECUTION

3.1 GENERAL

A. Minimize environmental damage during construction. Prevent discharge of fuel, oil, lubricants, and other fluids. Mitigate effects of discharge.

B. Install erosion and sediment control measures prior to clearing, demolition or construction.

C. Construct erosion and sediment control measures in accordance with standards and specifications of the "Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas", municipal regulations, and as follows:
1. Attend a preconstruction meeting with the Engineer, to review permit conditions and construction methods.

2. Provide additional sedimentation and erosion controls as required by municipal to address field conditions.
3. Do not discharge turbid water from dewatering to inland wetlands or watercourses.
4. Weekly and prior to any anticipated rain event, inspect site. Ensure that erosion controls are properly maintained and functioning.
5. Supply a 24-hour contact name and number as part of the erosion control plan.

D. Install additional control measures, if deemed necessary by the State, Municipality, Authorities Having Jurisdiction, or Owner.

E. Implement and maintain the Erosion and Sediment Control Plan. Inform parties engaged on the construction site of the requirements and objectives of the plan. Notify the proper municipal agency of transfer of this responsibility.

F. Protect catch basins with erosion control bales throughout construction until disturbed areas are stabilized.
1. Remove and dispose of sediment from control structures.

G. Control dust and wind erosion. Control dust to prevent a hazard to traffic on adjacent roadways. Dust control includes sprinkling of water and uniform application of calcium chloride on exposed soils and haul roads.

H. Do not discharge directly into wetlands or watercourses where dewatering is necessary. Utilize methods and devices as permitted by authorities having jurisdiction and appropriate regulations to minimize and retain suspended solids including pumping water into a temporary sedimentation bowl, providing surge protection at inlet and outlet of pumps, floating pump intake.
1. If pumping operation results in turbidity problems, stop pumping until means of controlling turbidity are determined and implemented.

I. Where control measures are required for longer than 60 days, use silt fence instead of straw bales.

J. Cut Areas
1. Establish an erosion control line (straw bale check or filter fabric) at toe of slope in cut areas and slope stabilization with mulch or grass within 30 days of start of cut operations.

K. Fill Areas
1. Establish an erosion control line (woodchip berm or filter fabric) approximately 10 feet from toe of slope of proposed fill areas prior to beginning fill installation.
2. Initiate slope stabilization with mulch or grass within 30 days of start of fill installation.

L. Within 7 days of completing slope construction, stabilize slopes with vegetation or matting to minimize exposure.

M. Stockpiles
1. Side Slopes: 2:1 maximum.
2. Surround stockpiles by a silt fence backed with sediment control bales.
3. Stabilize stockpiles left bare for more than 7 days with temporary vegetation or mulch.
4. Cover to prevent windblown dust.

N. Final Grading
1. If final grading is delayed for more than 30 days after land disturbances cease, stabilize soils with temporary vegetation or mulch.

O. Planting Season for Temporary Vegetation
1. March 1 to June 15 and August 1 to October 1.
2. After September 15, stabilize areas with straw bale check, filter fabric, or woodchip mulch.

P. Areas to Be Left Bare Prior to Finished Grading and Seeding
1. Within Planting Seasons
   a. Temporarily seed with Perennial Ryegrass
   b. Apply at a rate of 2 pounds per 1000 sq. ft. at a depth of 1/2 inch.
   c. Where grass predominates, fertilize according to a soil test at a minimum application rate of one pound per acre.
2. Outside of Planting Seasons
   a. Apply air-dried wood chip mulch, free of coarse matter.
   b. Apply at a rate of 185 to 275 pounds per 1000 sq. ft.

3.2 CONTROL SYSTEMS

A. Construction Entrance
1. Install at indicated site entrance locations.

B. Silt Fence
1. Install fencing at location as shown on the Drawings or where directed by the Engineer. Maintain pitch of 2 to 20 degrees, with inclination toward potential silt source.
2. Install bottom 8 inches of fabric by trenching and burying the fabric into the notched ground.
3. Drive posts into ground a minimum of 18 inches.
4. Locate fabric splices at posts only. Provide 6-inch overlap and seal.

C. Sediment Control Bales
1. Install at locations as shown on the Drawings or where directed by the Engineer. Place bales lengthwise with ends tight abutting one another. Install bales with bindings located on the sides.
2. Entrench bales 4 inches and backfill. Place backfill toward potential silt source.

3. Secure in place with 2 stakes per bale and insert straw in voids between bales.

D. Catch Basin Inserts
1. Remove catch basin grate, insert silt sack, and secure in place by replacing grate.

3.3 DUST CONTROL

A. Apply water and calcium chloride uniformly over the surface when dust becomes a nuisance or when directed by the Engineer. Provide shut-off valve in convenient location on water truck, to allow for regulating water flow.

3.4 FIELD QUALITY CONTROL

A. Construction Entrance Maintenance
1. Maintain in good condition throughout construction period.
2. Sweep adjacent roadways daily to remove tracked material from pavement.

B. Silt Fence and Sediment Control Bales Maintenance
1. Inspect control system immediately after each rainfall and daily during prolonged rainfall. Make repairs immediately.
2. Remove and dispose of accumulated sediments when sediment reaches approximately one-third the height of the control system, or when directed by the Engineer.
3. Replace control system promptly if fabric decomposes or system becomes ineffective prior to the expected usable life.
4. Maintain or replace system until no longer necessary for the intended purpose.

C. Catch Basin Insert Maintenance
1. Inspect after each major precipitation event. Inspect every two weeks if no major rain events have occurred.
2. Remove, clean, and reinstall silt sack when sediment accumulates to half capacity of sack.

3.5 REMOVAL

A. Remove and dispose of control systems after area stabilizes with new growth, or when directed by the Engineer.

END OF SECTION

SECTION 31 10 00 - 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. Protecting existing trees and other vegetation to remain.
2. Removing existing trees and other vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, removing site utilities, and abandoning site utilities in place.
7. Protect existing site improvements and utilities to remain.
8. Remove, stockpile, and protect existing site improvements.

B. Related Sections:

1. Section 01 57 13 Temporary Erosion and Sedimentation Control

1.3 DEFINITIONS

A. Finished Grade: Elevation of finished surface.

B. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

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

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is 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 more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

E. Landscape Topsoil: Proposed upper "A" horizon of soil in landscape areas that may or may contain a large proportion of Topsoil. All topsoil shall be imported from off site, tested and amended if necessary to meet soil standards.

F. Landscape Soil Profile: Proposed Landscape Soil profile made up of amended Subgrade ("C" horizon), Landscape Subsoil ("B" horizon), Landscape Topsoil ("A" horizon), and Mulch layer ("O" horizon).

G. Amended Subgrade: Surface or elevation remaining after completing excavation, filling or backfilling. Subgrade resulting from Earth Moving may or may not be suitable for plant growth and shall be amended by the Contractor to ensure it functions as the "C" horizon for the proposed landscape.

H. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

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

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

1.4 MATERIAL OWNERSHIP

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

1.5 INFORMATIONAL 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 videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Refer to section 01 78 39 Project Record Documents

2.1 QUALITY ASSURANCE

A. Preconstruction Meeting: Conduct meeting at Project site with Engineer and on-site supervisor.

2.2 PROJECT 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 traffic ways if required by Owner or authorities having jurisdiction.
3. Provide temporary signage to guide construction traffic.

B. Protect-In-Place Existing Site Improvements: Support and protect in place existing site improvement. Items include pipes, poles, wires, fences, curbing, property line marker, build foundations, and other structures.

1. Restore items promptly; do not leave until end of construction.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises, coordinate with engineer and Owner.

D. Utility Locator Service: Call Dig-Safe 811 or 1-888-DIG-SAFE a minimum of 72 hours prior to construction for area where Project is located before site clearing

1. Coordinate with appropriate Utility companies, and appropriate Agencies including municipal agencies, and pay for permits, fees licenses, etc., for utility service work, as necessary.
2. Utility providers for the project site include:

   Water, Sewer & Storm: Town of South Hadley

   Gas: Columbia

   Electric: South Hadley Electric Light Department

   Telecom: Verizon

E. Do not commence site clearing operations until temporary tree and plant protection measures are in place.

F. Do not direct vehicle or equipment exhaust toward tree and plant protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near tree and plant protection zones and organic mulch.

H. Do not commence site clearing operations until temporary erosion and sedimentation control measures, specified in Section 01 57 13 Erosion and Sedimentation Control, are in place. Coordinate all work and secure necessary permits within State right-of-ways with the Commonwealth of Massachusetts DOT, as required.

I. 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.

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

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

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

PART 3 - PRODUCTS

3.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer.

1. Use coating with a VOC content of 420 g/L (3.5 lb./gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 5 - EXECUTION

5.1 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.

2. Protect existing site features and structures as shown on plans. Any perimeter damaged or removed during construction must be replaced in kind.

C. Locate and clearly identify trees, shrubs, and other vegetation to remain . Tie a 1-inch blue-vinyl tape around each tree trunk at 54 inches above the ground.

D. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

5.2 EXCAVATION AROUND EXISTING TREES AND PLANTS

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

5.3 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

B. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.

C. Cut Ends: Do not paint cut root ends.

D. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.

E. Cover exposed roots with burlap and water regularly.

F. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

G. Root Pruning at Edge of Protection Zone: Prune roots 12 inches outside of the protection zone, by cleanly cutting all roots to the depth of the required excavation.

H. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

5.4 EXISTING UTILITIES

A. Contractor will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor. Allow for a minimum of two (2) weeks' notice for utility shut off requests.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

1. Fill abandoned culvert with structural fill at locations shown on plans.
2. Fill all catch basin and drainage structure that are to be abandoned in place with sand. Cap all pipes in structure.

D. 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 Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

F. Removal of underground utilities is included in earthwork sections and with applicable, electrical, and utilities sections.

5.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, individual branches, 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. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.
5. Prune trees and other vegetation only as necessary to complete work

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.

5.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 6 inches 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 more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. 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 protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.
5. Do not allow stockpile to remain for more than a year.

5.7 SITE IMPROVEMENTS

A. Remove existing above and below grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gravel parking, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along the line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
   a. Do not mix excavated pavement with other excavated materials
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

5.8 RESTORATION

A. Repair or restore existing site improvements and vegetation to remain, which is damaged by construction operation, to existing conditions or better as determined by the Engineer, at no additional cost to the Owner.

5.9 REMOVE AND STOCKPILE

A. Refer to site plans for items to be removed, stockpiled and returned to owner. Stockpile items on-site, and protect. If damaged replace in-kind at contractors expense.

5.10 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.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 31 20 00- 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.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for walks, pavements, lawns, and plantings.
2. Excavating and backfilling for structures, to the lines and grades shown on the Drawings.
3. Subbase course for structures, roads, walks, and pavements.
4. Base course for hot-mix asphalt paving.
5. Excavating and backfilling trenches for buried utilities and pits for buried utility structures.
6. When directed by the Engineer, backfilling with additional gravel fill areas excavated of buried construction debris and unsuitable material.
7. Disposal of unsuitable material.
8. Disposal of surplus suitable material, if required.

B. Related Sections include the following:

1. Section 01 57 13 Temporary Erosion and Sedimentation Control
2. Section 31 10 00 Site Clearing
3. Section 31 12 16 Asphalt Paving
4. Section 32 16 17 Curbing
5. Section 32 92 00 Lawns and Grasses

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill trench, structure or pit excavations.

1. Initial Backfill: Backfill placed below footings, slabs, pavements, against walls, and 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. Compaction: The tamping and rolling of all backfill placed in uniform horizontal layers not exceeding a defined un-compacted lift thickness.

C. "In-the-dry": In-situ moisture content of no more than two percentage points above the optimum moisture content.

D. Proof-rolling: The tamping and rolling of all subgrades and processed material not exceeding a defined un-compacted lift thickness.

E. Unsuitable material: Material containing vegetation or organic material, such as mulch, peat, organic silt, topsoil sod, deleterious material, and/or particles greater than 4 inches in diameter that is not satisfactory for use as determined by the Engineer.

F. Base Course: Layer placed between the subbase course and bituminous concrete paving.

G. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

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

I. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work. All additional excavation required to install per OSHA standards at no additional cost(i.e. trench box, sloping, etc. for all utilities and site improvements including but not limited to fence, fence posts, sign posts, bollards, concrete step footings, retaining walls, bleacher footings, ground mounted sign, retaining and sitting wall footings, flag pole footings).

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

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

K. Rock: Rock material in beds, ledges, un-stratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cubic yard for bulk excavation or 3/4 cubic yard for footing, trench, and pit excavation, that cannot be removed by rock excavating equipment, without systematic drilling, ram hammering, ripping, or blasting, when permitted; and that when tested by an independent geotechnical

testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches.

L. 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.

M. Subbase Course: Layer or layers placed between the subgrade and base course for bituminous concrete paving, or layer placed between the subgrade and a concrete pavement or walk.

N. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

O. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Each type of warning tape.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated. Prepare separate reports for each type and application of borrow and or fill material.

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.
3. Origin of material.
4. Classification and laboratory compaction curve for on-site soil material, in accordance with the above requirements, when requested by the Engineer.

C. Submit, in an airtight container for the testing laboratory, a 50-pound sample of each type of off-site fill material that is to be used at the site. Submit samples a minimum of two week prior to use of proposed material at the site. Submit samples to the testing laboratory (copy of these transmittal forms shall be simultaneously sent to Engineer) or if no testing laboratory then the Engineer shall be the recipient of the samples. Use of these proposed materials by the Contractor prior to testing and approval shall be at the Contractor's risk.

D. The Engineer will be responsible for the approval or rejection of the suitability of all materials.

E. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the project requires approval of the Owner or Engineer.

F. For use of geotextile fabrics or geogrids, submit manufacturer's product data including material's properties for approval by the Engineer.

G. For Record Purposes.

1. Excavation Protection System: Proposed system and design data; including certification by the qualified professional engineer responsible for their preparation.

H. 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.

1.5 QUALITY ASSURANCE

A. The Contractor shall retain and pay for the services of an independent testing and inspection firm and/or a Geotechnical Consultant to perform on-site observation and testing during the various phases of the construction operations. The Owner reserves the right to modify or waive the services of the independent testing and inspection firm and/or the Geotechnical Consultant. The services of an independent testing firm and/or Geotechnical Consultant may include, but not necessarily be limited to, the following:

1. Observation during excavation of structure and controlled fill areas.

2. Laboratory testing and analysis of fill materials as specified herein and proposed by the Contractor for incorporation into the Work.

3. Observation of construction and performance of water content, gradation and compaction tests at a frequency and locations that the independent testing and inspection firm and/or the Geotechnical Consultant may require. The results of these tests will be submitted to the Owner, Engineer, and Contractor on a timely basis so that action can be taken to remedy indicated deficiencies. During the course of construction, the independent testing and inspection firm and/or the Geotechnical Consultant will advise the Owner in writing, if at any time in their opinion, the Work hereunder is of unacceptable quality. Failure of independent testing and inspection firm and/or the Geotechnical Consultant to give notice, shall not excuse the Contractor from latent defects discovered in his work.

B. The Contractor shall make provisions for allowing observations and testing of Contractor's work by the independent testing and inspection firm and/or the Geotechnical Consultant.

C. The presence of the independent testing and inspection firm and/or the Geotechnical Consultant does not include supervision or direction of the actual work of the Contractor, and his employees or agents. Neither the presence of the independent testing and inspection firm and /or the Geotechnical Consultant, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

D. Costs related to retesting due to unacceptable qualities of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

E. MassDOT Spec: Commonwealth of Massachusetts, Massachusetts Department of Transportation, Standard Specifications for Highways and Bridges.

1.6 PROJECT 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. If required, a traffic management plan should be submitted for approval by engineer and owner.

3. Implement traffic management plan as shown in this project plan set, per the William's Master TMP and as advised by the Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Engineer.

C. Utility Locator Service: Notify Dig Safe for area where Project is located before site clearing.

1. Coordinate with appropriate Utility Companies, and appropriate Agencies including municipal agencies, and pay for permits, fees licenses, etc., for utility service work, as necessary.

D. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's written permission.

3. Contact "Dig Safe" before excavating. Proceed with excavation only after utility locator service completes marking of utility locations.

E. Coordinate with utility companies to shut off services if underground utility lines are active and are determined by contractor to be removed.

F. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 01 57 13 "Erosion and Sedimentation Control," are in place

G. Do not commence earth moving operations until plant-protection measures, specified in Section 01 56 39 "Temporary Tree and Plant Protection", are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Fill materials obtained from off-site sources that are DEP disposal sites shall be acceptable for use only when accompanied by an LSP opinion stating that the soils do not contain detectable quantities of oil and/or hazardous materials.

B. Structural Fill: Fill shall be used as fill beneath footings, pavement, and for other areas to the thicknesses and extent shown on the plans. It shall be a natural soil obtained from an off-site commercial source. It shall be free of ice, snow, roots, sod, rubbish, oil, hazardous material and other deleterious or organic matter. It shall be graded within the following limits:

U. S. Standard Sieve Size	Percent Finer by Weight
2 inch	100
½ inch	50-85
No. 4	40-75
No. 40	10-35
No. 200	0-8

C. Sand: Sand shall consist of clean, inert, hard, durable grains of quartz or other hard, durable rock, free from loam or clay, surface coatings and deleterious materials.

1. The allowable amount of material passing a No. 200 sieve as determined by AASHTO-T11 or ASTM D422 shall not exceed 10 percent by weight. The maximum particle size shall be 1/4-inch (i.e., 100 percent passing the No. 4 sieve).
2. In addition to the above criteria when sand is used for utility bedding it shall conform to the following gradation:

U. S. Standard Sieve Size	Percent Finer by Weight
No. 4	100
No. 8	80-95
No. 16	55-85
No. 50	0-35
No. 200	0-5

D. Processed Gravel for Base Course and Subbase: Processed Gravel shall meet the Massachusetts Highway Department (MassDOT) standard for highways and bridges mi .03.0 gravel borrow Type B.

1. This gravel will be tested for grain size-gradation-prior to placement to assure it meets this criteria.

U. S. Standard Sieve Size	Percent Finer by Weight
3"	100
½"	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-10

2. If the gravel satisfies this specification, then a proctor determination will be performed to obtain the maximum dry density for this material. Field Density Tests will be performed prior to placement of Hot Mix Asphalt to assure that a minimum of 95% of this maximum dry density has been obtained.

E. Ordinary Fill: Ordinary Fill shall be used as fill for excavations at depths greater than 12 inches (minimum) below footing, and pavements, and for other areas shown on the plans as required to achieve final grades. It shall be a natural soil obtained from an off-site commercial source. It shall be free of ice, snow, roots, sod, rubbish, oil, hazardous material and other deleterious or organic matter. It shall be graded within the following limits:

U. S. Standard Sieve Size	Percent Finer by Weight
2 inch	100
No. 10	30-90
No. 40	10-70
No. 200	0-15

F. Washed Crushed Stone:

1. ¼-Inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.6.

2. 3/4-inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.4

3. 2-inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.1 and M2.01.2 with the following grading requirements:

U. S. Standard Sieve Size	Percent Finer by Weight
2 ½ inch	100
2 inch	95-100
1 ¼ inch	35-70
¾ inch	0-25

G. Trench Backfill: Processed Gravel, free of rock or gravel larger than 3 inches in any dimension.

H. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

I. Satisfactory Soils: Free of debris, waste, frozen materials, vegetation, clay and other deleterious matter; adequately graded for satisfactory compaction.

1. Topsoil: Native or imported topsoil, or surface soil modified to become topsoil; mixed with soil amendments. Free of masses of roots and individual roots more than 6 inches long and 1/2 inch in diameter, subject to approval by the Engineer.

2. Processed Gravel: Free of rock or gravel larger than 3 inches in any dimension.

J. Backfill and Fill: Satisfactory soil materials.

2.2 ACCESSORIES

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

1. Identifying Colors for Utilities:

a. Red: Electric.

b. Yellow: Gas, oil, steam, and dangerous materials.

c. Orange: Telephone and other communications.

d. Blue: Water systems.

e. Green: Sewer systems.

B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lbf; ASTM D 4632.

2. Tear Strength: 40 lbf; ASTM D 4533.

3. Puncture Resistance: 50 lbf; ASTM D 4833.

4. Water Flow Rate: 150 gpm per sq. ft.; ASTM D 4491.

5. Apparent Opening Size: No. 50; ASTM D 4751.

C. Geogrid: Punched polypropylene sheet, specifically manufactured as a soil reinforcement.

1. Tensar TriAx Geogrid TX-5 or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding or damaging Project site and surrounding area.

B. Protect excavations, backfills, fills and 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. Provide positive drainage of backfill and fill.

2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain dewatering until structures, pipes and appurtenances will not be damaged by surface or ground water. Maintain until dewatering is no longer required.

C. Obtain discharge permit for water discharging into storm drainage system or waterway. Remove particulate matter from pumped or drained water which discharges or flows into storm drainage system or waterway.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Excavation and Grades:

1. Place erosion control measures including the straw bales and silt fence prior to the intrusive work activities.

2. Contractor shall place or excavate fill materials to the grades shown on the Drawings.

3. Approximate limits of areas to be filled are shown on the Drawings.

4. Placement thickness and compaction criteria for Engineered Fills shall be in accordance with the Article 3.15 of this section.

5. Prior to the placement of any fill, the Contractor shall remove any unsuitable soils, as determined by the Engineer, and proof roll the existing site soils with at least four passes with a vibrating drum roller (weighing a minimum of 6,000 pounds).

B. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

C. Removal of Unsuitable Soil: Remove all unsuitable materials, including stumps, organic materials, demolition debris from and broken pavement, from proposed retaining wall area and under sidewalks, new pavements or related structures.

1. Excavated fill may be reused for site grading providing it meets soil material specifications

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

1. Excavate by hand 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. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavation for Underground Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

B. Foundation Excavation: over-excavate fill to full depth below footings including the influence zone

1. Influence zone: imaginary line extending downward and outward from footing edge at a 1H: 1V slope to firm bearing soils.

3.6 EXCAVATION PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

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

B. Excavate trenches to uniform widths to provide a working 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: As indicated.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

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

3.8 SUBGRADE PREPARATION

A. Divert storm run-off away from construction site, reduce traffic in sensitive areas, and maintain an effective de-watering program to reduce sub-grade disturbance influenced by excavation methods, moisture, precipitation, groundwater control, and construction activities.

B. Over-excavate soils exhibiting weaving or instability and replace with a Free-Draining Sand-Gravel.

C. If unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed by Owner or Engineer.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

D. Subgrades will be compacted with a minimum of six (6) passes with a 10-ton vibratory roller. Do not proof roll wet or saturated subgrades.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

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 may be used when approved by Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Prevent windblown dust. Provide erosion control measures.

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

2. Stockpile excess cut materials to be placed on site as indicated on plans.

3.11 BACKFILL

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

1. Construction below finish grade.
2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

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 footing: backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.

G. Place and compact final backfill of satisfactory soil material to final subgrade.

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

1. Install detectable warning tape over non-ferrous piping.

3.13 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 3 horizontal so fill material will bond with existing material.

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

D. Place soil fill on subgrade free of mud, frost, snow, or ice.

3.14 MOISTURE CONTROL

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

1. Do not place backfill or fill 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 BACKFILLS AND FILLS

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

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

1. In-place fill for below structural fill below footings compacted to a minimum of 95 percent.

2. Sand backfill against the rear of foundation walls and retaining walls backfill compacted to a minimum of 90 percent.

3. Structural fill, raise-in-grade fill and foundation backfill compacted to a minimum of 95 percent.

4. Processed gravel for pavement base course compacted to a minimum of 95 percent.

5. Ordinary fill for raise-in-grade fill below parking areas and non-bearing applications compacted to a minimum of 92 percent.

3.16 GRADING

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

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. Topsoil Finished Grade Adjacent to Walkway Surfaces: 1 inch below walkway finished grade.

C. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus ½ inch, however, not consistently in one direction.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

3.17 SUBBASE AND BASE COURSES

A. Under pavements, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.
2. Compact subbase and base courses 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 D 1557.
    a. Place material to indicated thickness within 1/2 inch, plus or minus.
3. Shape subbase and base to required crown elevations and cross-slope grades.
4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.18 EXCAVATION AND BACKFILL FOR UTILITY WORK BY OTHERS

A. Contractor responsible for excavation, excavation support and backfill for electrical, telephone, data, and gas utility work to be done by others.

3.19 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

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

C. 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 Engineer.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or slab, but in no case fewer than three tests.

2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two test.

E. 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 to depth required; re-compact and retest until specified compaction is obtained.

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 Engineer; reshape and re-compact.

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 the greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION - 32 12 16 – 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
   2. Porous asphalt pavement

B. Related Sections:
   1. Site 31 10 00 "Site Clearing"
   2. Section 31 20 10 Earth Moving
   3. Section 32 30 53 "Miscellaneous Cast-in-Place Concrete"

1.3 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

B. Hot mix asphalt Surface Course: The asphalt-aggregate top course of a hot mix asphalt pavement, sometimes called a wearing course.

C. Hot mix asphalt Intermediate Course: An intermediate course of a hot mix asphalt pavement, located between the hot mix asphalt surface course and the intermediate course.

D. Hot mix asphalt Wearing Surface: The asphalt-aggregate course of hot mix asphalt pavement atop the concrete bridge deck.

1.4 SUBMITTALS

A. Job-Mix Design Certification: For each job mix proposed for the Work, signed by the supplier.

B. Qualification Data: For hot mix asphalt supplier.

C. Material Certificates: For each paving material, signed by manufacturers.

D. Product Data: For each joint-sealant product indicated.

E. Field Data Rest Reports: For paving thickness, surface smoothness, and in-place density test results.

F. List of completed porous asphalt installations completed by installer within the last three (3) years.

G. Five (5) project references for applications in which Installer has installed porous asphalt.

1.5 QUALITY ASSURANCE

A. Codes and Standards - All materials, methods of construction and workmanship shall conform to applicable requirements of AASHTO ASTM Standards supplements and updates), or other standards as specified.

B. Installer Qualifications:

1. Installer must provide adequate number of skilled workers who are thoroughly trained and experienced in placement of porous asphalt pavement.

2. Installer must have successfully installed porous asphalt pavement at least five (5) locations within the previous three (3) years.

C. Show evidence of Asphalt manufacturer's authorized installer who is trained and approved for installation of porous asphalt required for this Project.

D. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

E. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MassDOT for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

F. Pre-installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

b. Review condition of subgrade and preparatory work.

c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Transport hot mix asphalt mixture in accordance with Section 460 of the Standard Specifications.

B. Deliver mixture within a tolerance of plus or minus 15 deg F of approved job mix formula temperature.

1.7 PROJECT 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 60 degrees F (15.6 degrees C).
   2. Tack Coat: Minimum surface temperature of 60 degrees F (15.6 degrees C).
   3. Asphalt Base Course: Minimum surface temperature of 40 degrees F (4.4 degrees C) and rising at time of placement.
   4. Asphalt Surface Course: Minimum surface temperature of 60 degrees F (15.6 degrees C) 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, sound; 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, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a.

B. Asphalt Cement: ASTM D 3381.

C. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70. Asphalt emulsion prime coat complying with MassDOT requirements.

D. Tack Coat: ASTM D 977 or emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Water: Potable.

2.3 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes, MassDOT designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."
   1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
   2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the pavement thickness shown on the plans.

B. Porous Asphalt Pavement: Plant mixes in accordance with requirements specified in University of New Hampshire Stormwater Center (UNHSC) "Design Specifications for Porous Asphalt Pavement and Infiltration Beds."
   1. Mix Materials
      a. Materials consist of modified performance grade asphalt binder (PGAB), coarse and fine aggregates, and optional additives such as silicone, fibers, mineral fillers, fatty amines, and hydrated lime. Materials shall meet the requirements of the NAPA's Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115 (2002), except where noted otherwise below or approved in writing by the Engineer.
   2. Polymer Modified PGAB and Mix Designs
      a. Asphalt Binder: Polymer and/or fiber modified Performance Graded asphalt binder (PGAB) used in the production of Superpave Hot Mix Asphalt (HMA) mixtures. Ideally for maximum durability, the PGAB shall be two grades stiffer than that required for dense mix asphalt (DMA) parking lot installations, which is often achieved by adding a polymer and/or fiber.
      b. The PGAB polymer modifiers are to be either styrene butadiene rubber (SBR) or styrene butadiene styrene (SBS). SBS is typically reserved for large projects as terminal pre-blending is required. SBR is feasible for smaller projects as it can be blended at the plant or terminal blended. The quantity of rubber solids in the SBR shall typically be 1.5 to 3 percent by weight of the bitumen content of the mix.
   3. Provide mixes with a history of satisfactory performance in geographical area where Project is located, or provide materials combined and graded to meet the composition limits by mass (weight) as shown in the following Table.

Sieve Size (inch/mm)	Percent Passing (%)
0.75/19	100
0.50/12.5	85-100

Sieve Size (inch/mm)	Percent Passing (%)
0.375/9.5	55-75
No.4/4.75	10-25
No.8/2.36	5-10
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	6 - 6.5%
Fiber Content by Total Mixture Mass	0.3% cellulose or 0.4% mineral
Rubber Solids (SBR) Content by Weight of the Bitumen	1.5-3% or TBD
Air Void Content (ASTM D6752/AASHTO T275)	16.0-22.0%
Draindown (ASTM D6390)*	$\leq$ 0.3 %
Retained Tensile Strength (AASHTO 283)**	$\geq$ 80 %
Cantabro abrasion test on unaged samples (ASTM D7064-04)	$\leq$ 20%
Cantabro abrasion test on 7 day aged samples	$\leq$ 30%

*Cellulose or mineral fibers may be used to reduce draindown.

**If the TSR (retained tensile strength) values fall below 80% when tested per NAPA IS 131 (with a single freeze thaw cycle rather than 5), then in Step 4, the contractor shall employ an antistrip additive, such as hydrated lime (ASTM C977) or a fatty amine, to raise the TSR value above 80%.

4. Course Depth and Class: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment 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. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
   3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of top course of asphalt.

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd.
   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with tack coat as outlined above. Then cover with-hot-mix surface layer compacted and finished flush with adjacent surfaces.

3.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
   3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
   1. If prime coat is not entirely absorbed within 24 hours after application,

spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.

2. Protect primed substrate from damage until ready to receive paving.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal. /sq. yd.
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 POROUS ASPHALT PAVEMENT

A. Crushed Stone: Refer to Section 31 20 00"Earth Moving".

B. Porous Asphalt Pavement:

1. Place geotextile filter fabric along side slopes in accordance with manufacturer's recommendations.

2. Do not overcompact base, subbbase or reservoir courses.

3. Install porous asphalt in single lift.

3.6 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to 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 base course in number of lifts and thicknesses indicated.

2. Place hot-mix asphalt surface course in single lift.

3. Spread mix at minimum temperature of 250 deg F (121 deg C).

4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.

5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

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.

3.7 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. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
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.

3.8 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

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: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
2. Track Base Course Density: 95 percent or per manufacturer's recommendations.

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.

3.9 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.

2. 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: 1/8 inch.

3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances outlined above.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core

samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1,000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

G. Porous Asphalt Pavement: All requirements for standard bituminous concrete paving shall apply. In addition, perform testing in accordance with UNGWSC " Porous Asphalt Pavement and Infiltration Beds Design Specifications" including the following:

1. Hose Test: The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gpm over the surface, using a hose or other distribution devise. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. All applied water shall infiltrate directly without large puddle formation or surface runoff, and shall be observed by the Engineer.

3.11 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION - 32 16 14 - CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Precast Curbing installation

B. Related Sections:
   1. Section 31 20 00 Earth Moving

1.3 SUBMITTALS

A. Material Certification. For each product, certifying material meets the Specification requirements.

1.4 QUALITY ASSURANCE

A. Where "MassDOT Standard Specification" is referenced, it shall mean "Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges" and supplemental specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Mortar: MassDOT Standard Specification, Section M4.02.15.

B. Cement Concrete Precast Units: MassDOT Standard Specification, Section M4.02.14
   1. Type: As indicated.

C. Cement Concrete: MassDOT Standard Specification, Section M4.02.00

PART 3 - EXECUTION

3.1 INSTALLATION

A. Excavate, prepare foundation, set curb, and point joints in accordance with MassDOT Standard Specification, Section 501.
   1. Install curbing as indicated and as recommended by manufacturer and as shown on the plans.

3.2 INSTALLATION TOLERANCES

A. Curb Alignment: 1/4-inch maximum, as determined by using a 10-foot straight edge along front face of curb.

END OF SECTION

SECTION - 32 92 00 - LAWNS 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. This Section includes the following:

1. Seeding.

B. Related Sections include the following:

1. Section 31 10 00 Site Clearing
2. Section 31 20 00 Earth Moving

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of topsoil.

B. Topsoil: Native or imported topsoil, or surface soil modified to become topsoil; mixed with soil amendments. Free of masses of roots and individual roots more than 6 inches long and 1/2 inch in diameter, subject to approval by the Engineer.

C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath topsoil.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

C. Product Certificates: For soil amendments, fertilizers, and mulch, signed by product manufacturer.

D. Qualification Data: For landscape Installer.

E. Material Test Reports: For existing surface soil and imported topsoil.

F. Planting Schedule: Indicating anticipated planting dates for each type of planting.

G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent 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. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.7 SCHEDULING

A. 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. Spring Planting: April 1 to June 1.

2. Fall Planting: August 15 to October 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.8 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 60 days from date of Substantial Completion.
    a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.
    1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn 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 lawn at a minimum rate of 1 inch per week.

D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of grass height. Remove no more than 40 percent 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 grass height of 2 to 3 inches.

E. Lawn Post-fertilization: Apply fertilizer after initial mowing and when grass is dry.
    1. Use fertilizer that will provide actual nitrogen of at least 1 lb./1000 sq. ft. to lawn area.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
    1. New Lawns: Valley Green Mix #1 or approved equal. Valley Green, USA Holyoke, MA 1-800-862-0089 www.valleygreenusa.com

Over Seeding for established turf: Valley Green Mix #2 or approved equal. Valley Green, USA Holyoke, MA 1-800-862-0089 www.valleygreenusa.com

New Loam Seed Mix	
Creeping Red Fescue	40%
Chewing Fescue	40%
Perennial Rye	20%
Overseeding Seed Mix	
Perennial Rye	80%
Kentucky Bluegrass	20%

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, 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 or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

1. Provide lime in form of dolomitic limestone, with a minimum of 95 percent passing a No. 100 sieve.

B. Perlite: Horticultural perlite, soil amendment grade.

C. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

1. Organic Matter Content: 50 to 60 percent of dry weight.

a. State of Connecticut, Department of Environmental Protection approved when derived from food and agricultural residues, animal manures, and sewage sludge.

B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 PLANTING ACCESSORIES

A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.6 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 18 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. 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 agency.

2.7 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, threshed straw of wheat, rye, oats, or barley.

B. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.8 TOPSOIL MIX

A. Topsoil Mix: Mix topsoil with soil amendments and fertilizers in quantities required by the Soil Test Report, Document 00 31 32.16.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

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 overspray.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 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 topsoil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend topsoil mix.

a. Delay mixing fertilizer with topsoil if planting will not proceed within a few days.

b. Mix lime with dry soil before mixing fertilizer.

2. Spread topsoil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if topsoil or subgrade is frozen, muddy, or excessively wet.

C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least of 6 inches. Apply soil amendments and fertilizers according to topsoil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.
3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, 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 tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1,500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.5 LAWN RENOVATION

A. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish lawn where settlement or washouts occur or where minor re-grading is required.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

D. Mow, dethatch, core aerate, and rake existing lawn.

E. Remove waste and foreign materials, including grass, vegetation, and turf, and legally dispose of them off Owner's property.

F. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

G. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 4 inches of existing soil. Provide new topsoil to fill low spots and meet finish grades.

H. Apply seed and protect with straw mulch as required for new lawns.

I. Water newly planted areas and keep moist until new lawn is established.

3.6 SATISFACTORY LAWNS

A. Satisfactory Seeded Lawn: 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 3 by 3 inches.

B. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.7 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.

C. Remove erosion-control measures after grass establishment period.

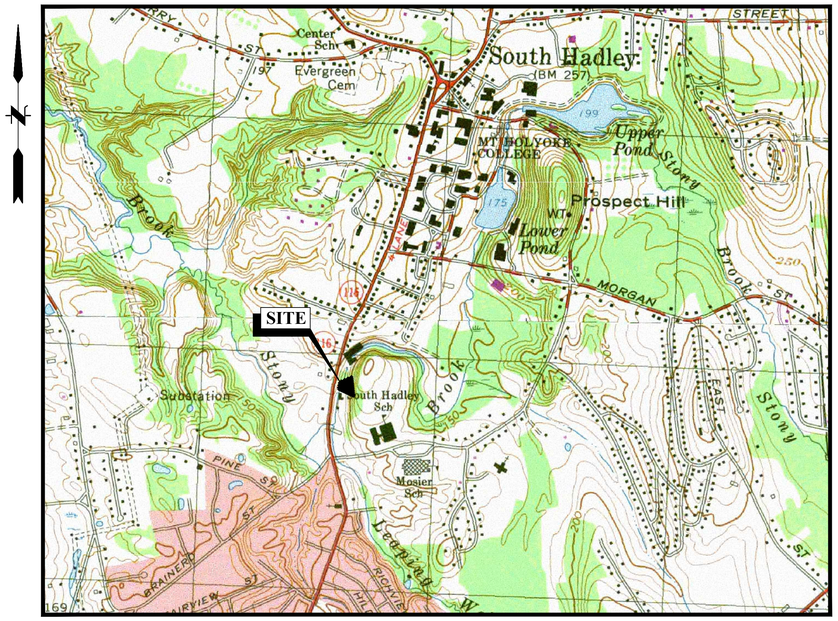
END OF SECTION

SHELD - TELECOM SUBSTATION IMPROVEMENTS

COLLEGE STREET · SOUTH HADLEY · MASSACHUSETTS

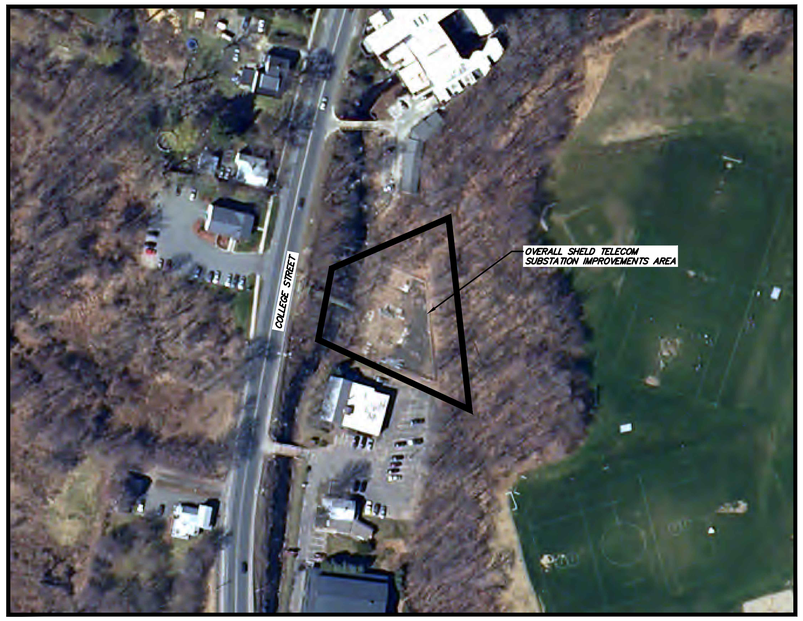
BID SET

JULY 1, 2020



LOCATION MAP

SCALE: 1" =1000'



LOCATION MAP

SCALE: 1" =100'

SHEET INDEX

PREPARED FOR

SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT

85 MAIN STREET
SOUTH HADLEY, MA 01075

PREPARED BY

FUSS & O'NEILL

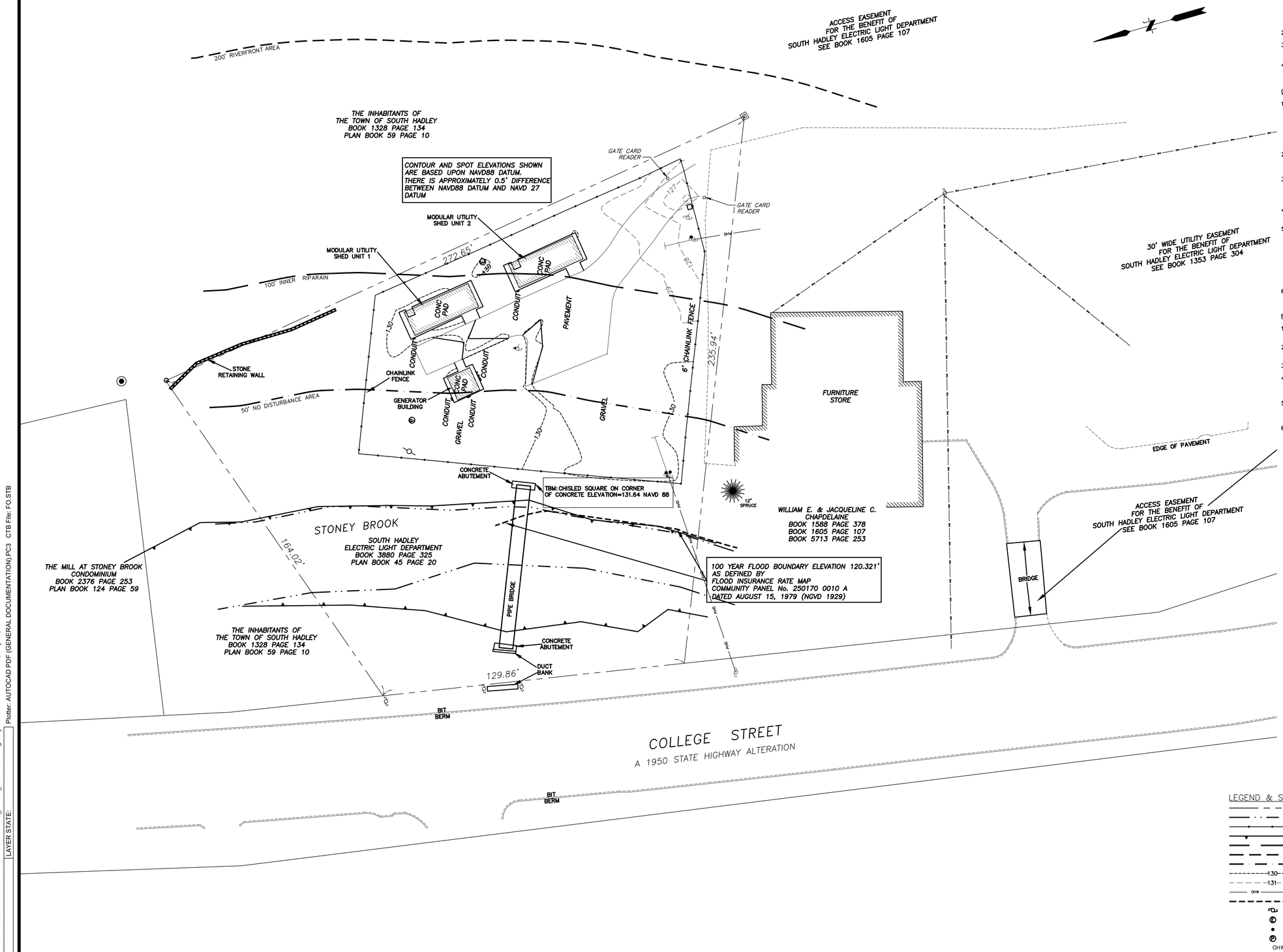
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

DANIEL F. DELANY CIVIL NO. 43477 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

7/8/2020

PROJ. No.: 20190284.A10
DATE: 07/01/2020

C0.00



MAP REFERENCE

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN ARE BASED ON A PLAN ENTITLED: 6566SH04-AS SENT 082319, REVISED THROUGH: AUGUST, 2019 PREPARED BY HERITAGE SURVEYS, INC., REGISTERED PROFESSIONAL LAND SURVEYORS, COLLEGE HIGHWAY & CLARK STREET, POST OFFICE BOX 1, SOUTHAMPTON, MASSACHUSETTS
2. TOPOGRAPHIC ELEVATIONS ARE BASED ON NAVD88 DATUM.
3. VERTICAL BENCHMARK CHISELED SQUARED ON CORNER OF CONCRETE. ELEVATION 131.64', NAVD 88
4. 100 YEAR FLOOD BOUNDARY BASED ON "FLOOD INSURANCE RATE MAP", COMMUNITY-PANEL NUMBER 250170 0010 A, EFFECTIVE DATE AUGUST 1, 1979 (NGVD 1929).

GENERAL NOTES

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF PREFABRICATED BUILDING.
5. LOCATION OF UTILITIES SHOWN HEREON ARE THE RESULT OF SURFACE EVIDENCE AS LOCATED BY FIELD SURVEY, PLANS OF RECORD, INFORMATION FURNISHED BY THE RESPECTIVE UTILITY COMPANIES, AND OTHER AVAILABLE SOURCES. THIS PLAN DOES NOT NECESSARILY DEPICT THE EXACT LOCATION OF ALL UTILITIES WHICH MAY EXIST AT THIS TIME WITHIN THE PREMISES SURVEYED. LOCATIONS SHOULD BE VERIFIED BY THE RESPECTIVE UTILITY COMPANY BEFORE BEING RELIED UPON. ALL FIELD CHANGES MUST BE APPROVED BY THE ENGINEER.
6. LOCATION AND INVERTS OF EXISTING UTILITIES SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO CONSTRUCTION. ALL FIELD CHANGES MUST BE APPROVED BY THE ENGINEER.

REGULATORY REQUIREMENTS

1. NOTIFY TOWN CONSERVATION COMMISSION A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. FIELD INSPECTOR SHALL BE NOTIFIED 48 HOURS PRIOR TO CONSTRUCTION.
3. APPROVED PLANS SHALL BE ON SITE AT ALL TIMES.
4. THE CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
5. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
6. CALL DIG-SAFE 811 OR 1-888-DIG-SAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.

LEGEND & STANDARD ABBREVIATIONS

- PROPERTY LINE
- EDGE OF BROOK
- EXISTING CHAINLINK WITH BARB WIRE FENCE
- APPROXIMATE MEAN ANNUAL HIGH (BANK)
- 100' INNER RIPARAIN
- 200' RIVERFRONT AREA
- 50' NO DISTURBANCE AREA
- 130 EXISTING MAJOR CONTOUR
- 131 EXISTING MINOR CONTOUR
- OHW EXISTING OHW
- 100 YEAR FLOOD BOUNDARY
- EXISTING UTILITY POLE
- E EXISTING ELECTRIC MANHOLE
- EXISTING CONDUIT
- P EXISTING PROPANE MANHOLE
- OHW OVERHEAD WIRE

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

DANIEL F. DELANY
CIVIL
NO. 43477
REGISTERED PROFESSIONAL ENGINEER
7/8/2020

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.:
VERT.:
20 10 0 20
GRAPHIC SCALE

FUSS & O'NEILL
1350 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
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www.fando.com

SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT
EXISTING CONDITIONS PLAN
COLLEGE STREET
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
DATE: 07/01/2020

C1.00

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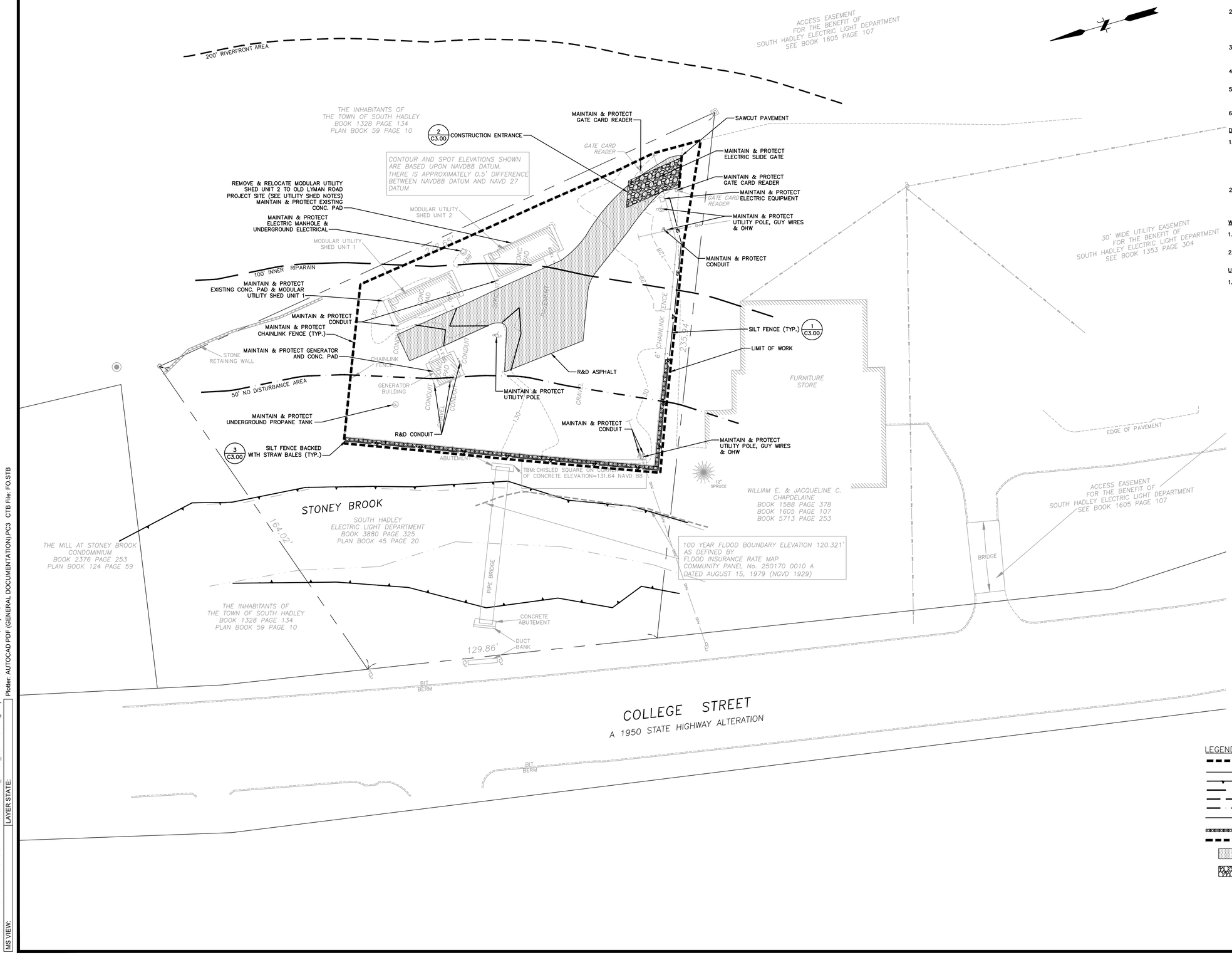

EARTHWORK

1. CALL DIG-SAFE 811 OR 1-888-DIG-SAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.
3. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
4. REFER TO EROSION AND SEDIMENTATION CONTROL DETAILS FOR EROSION AND SEDIMENTATION CONTROL NOTES.
5. CATCH BASINS WITHIN THE WORK AREA OR DOWN STREAM OF DRAINAGE FLOW SHALL BE PROTECTED WITH CATCH BASIN SILT SACKS.
6. WATER AND CALCIUM CHLORIDE MUST BE AVAILABLE AT ALL TIMES FOR DUST CONTROL.

DEMOLITION

1. THE DEMOLITION PLAN IS PROVIDED FOR INFORMATION ONLY AND MAY NOT INDICATE ALL ITEMS REQUIRED TO BE DEMOLISHED. PERFORM A PRE-BID SITE INSPECTION. COORDINATE DEMOLITION OF UNIDENTIFIED UTILITIES OR STRUCTURES WITH OWNER. DEMOLISH STRUCTURES, SITE IMPROVEMENTS, UTILITIES, ETC. AS REQUIRED TO CONSTRUCT PROPOSED FACILITY AND UTILITY SERVICES.
2. ITEMS TO BE STOCKPILED ON-SITE FOR REUSE OR TO BE RELOCATED SHALL BE PROTECTED FROM CONSTRUCTION OPERATIONS. IF DAMAGED DURING CONSTRUCTION THEY SHALL BE REPLACED IN-KIND AT NO ADDITIONAL COST TO THE OWNER.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
2. WORK IS RESTRICTED TO THE HOURS OF 7AM TO 5PM, MONDAY THROUGH FRIDAY.

UTILITY SHED NOTES

1. REMOVAL AND RELOCATION OF MODULE SHED UNIT 2 IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL COORDINATE WITH LYMAN STREET SITE CONSTRUCTION TO ENSURE SITE IS PREPARED TO RECEIVE UNIT.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- APPROXIMATE MEAN ANNUAL HIGH (BANK)
- 100' INNER RIPARAIN
- 200' RIVERFRONT AREA
- 50' NO DISTURBANCE AREA
- SF — SILT FENCE
- STRAW BALES
- SAWCUT PAVEMENT
- R&D ASPHALT
- CONSTRUCTION ENTRANCE

R&D	REMOVE & DISPOSE
TYP.	TYPICAL
CONC.	CONCRETE
OHW	OVER HEAD WIRE

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

DANIEL F. DELANY CIVIL NO. 43477 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
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SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT
SITE PREPARATION & DEMOLITION PLAN
COLLEGE STREET
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
DATE: 07/01/2020

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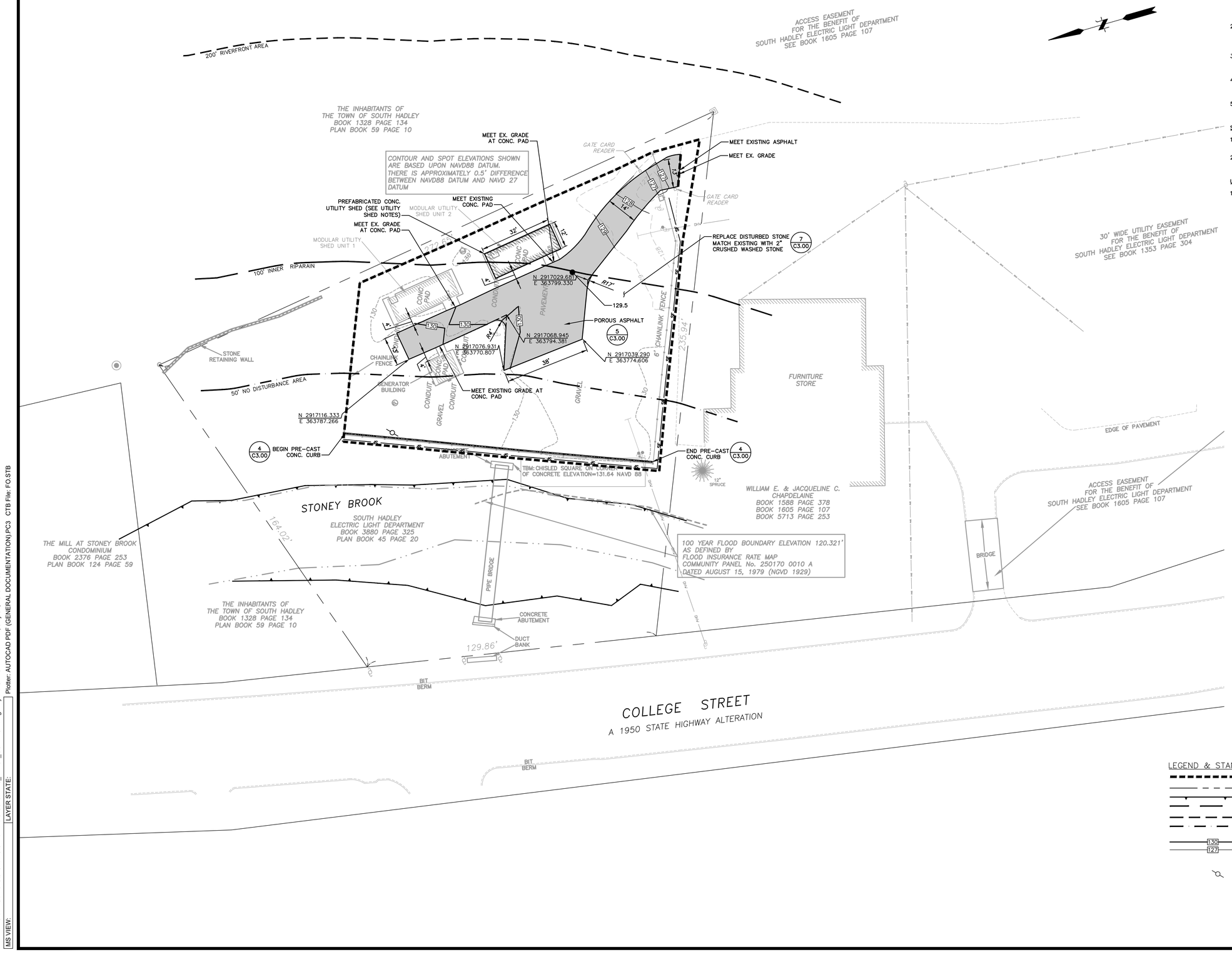

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.

SITE RESTORATION

1. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
2. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS OUTSIDE OF THE WORK AREA TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

UTILITY SHED NOTES

1. PREFABRICATED CONCRETE UTILITY SHED SHOWN FOR CLARITY. SUPPLIED SHED MUST MEET THE GEOMETRY AND DIMENSIONS AS SHOWN ON PLANS AND PROVIDED IN SPECIFICATIONS. CONTRACTOR MUST SUBMIT FULL SHOP DRAWINGS AND DESIGN CALCULATION PREPARED AND STAMPED BY MANUFACTURE.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- APPROXIMATE MEAN ANNUAL HIGH (BANK)
- 100' INNER RIPARAIN
- 200' RIVERFRONT AREA
- 50' NO DISTURBANCE AREA
- PROPOSED UNDERGROUND CONDUIT TRENCH
- 130 PROPOSED MAJOR CONTOUR
- 127 PROPOSED MINOR CONTOUR
- PROPOSED EXCAVATION FOR VAULT
- UTILITY POLE

BID SET

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SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT

SITE LAYOUT & GRADING PLAN

COLLEGE STREET

SOUTH HADLEY MASSACHUSETTS

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UTILITIES

1. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.
2. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.
3. PAY ALL FEES AND COSTS ASSOCIATED WITH UTILITY MODIFICATIONS AND CONNECTIONS, REGARDLESS OF THE ENTITY THAT PERFORMS THE WORK.
4. COORDINATE THE WORK AND WORK SCHEDULE WITH SHELD. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.

ACCESS EASEMENT FOR THE BENEFIT OF SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT SEE BOOK 1605 PAGE 107

200' RIVERFRONT AREA

THE INHABITANTS OF THE TOWN OF SOUTH HADLEY BOOK 1328 PAGE 134 PLAN BOOK 59 PAGE 10

CONTOUR AND SPOT ELEVATIONS SHOWN ARE BASED UPON NAVD88 DATUM. THERE IS APPROXIMATELY 0.5' DIFFERENCE BETWEEN NAVD88 DATUM AND NAVD 27 DATUM

EXCAVATION FOR COMMUNICATION VAULT PROVIDED AND INSTALLED BY OWNER. COORDINATE WITH OWNER PRIOR TO EXCAVATION AND BACKFILL

GATE CARD READER

GATE CARD READER

MODULAR UTILITY SHED UNIT 2

MODULAR UTILITY SHED UNIT 1

CONC PAD

CONC PAD

CONC PAD

CONC PAD

100' INNER RIPARAIN

PAVEMENT

6' CHAINLINK FENCE

235.94'

STONE RETAINING WALL

CHAINLINK FENCE

50' NO DISTURBANCE AREA

GENERATOR BUILDING

CONDUIT

CONDUIT

CONDUIT

CONDUIT

GRAVEL

GRAVEL

6 / C3.00 UNDERGROUND CONDUIT TRENCH (TYP.) AND BACKFILL CONDUIT TO BE PROVIDED AND INSTALLED BY OWNER. COORDINATE WITH OWNER PRIOR TO TRENCHING AND BACKFILL

EXCAVATION FOR UTILITY POLE. UTILITY POLE PROVIDED AND INSTALLED BY OWNER

CONCRETE ABUTEMENT

TBM: CHISLED SQUARE ON CORNER OF CONCRETE ELEVATION=131.64 NAVD 88

12" SPRUCE

FURNITURE STORE

EDGE OF PAVEMENT

WILLIAM E. & JACQUELINE C. CHAPDELAINE
BOOK 1588 PAGE 378
BOOK 1605 PAGE 107
BOOK 5713 PAGE 253

30' WIDE UTILITY EASEMENT FOR THE BENEFIT OF SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT SEE BOOK 1353 PAGE 304

ACCESS EASEMENT FOR THE BENEFIT OF SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT SEE BOOK 1605 PAGE 107

STONEY BROOK

SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT
BOOK 3880 PAGE 325
PLAN BOOK 45 PAGE 20

164.02'

THE MILL AT STONEY BROOK CONDOMINIUM
BOOK 2376 PAGE 253
PLAN BOOK 124 PAGE 59

100 YEAR FLOOD BOUNDARY ELEVATION 120.321' AS DEFINED BY FLOOD INSURANCE RATE MAP COMMUNITY PANEL No. 250170 0010 A DATED AUGUST 15, 1979 (NGVD 1929)

BRIDGE

PIPE BRIDGE

CONCRETE ABUTEMENT

DUCT BANK

129.86'

THE INHABITANTS OF THE TOWN OF SOUTH HADLEY BOOK 1328 PAGE 134 PLAN BOOK 59 PAGE 10

BIT BERM

COLLEGE STREET

A 1950 STATE HIGHWAY ALTERATION

BIT BERM

LEGEND & STANDARD ABBREVIATIONS

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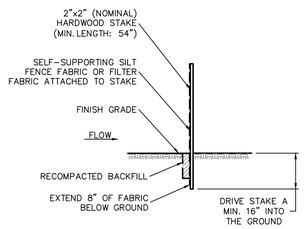
EROSION & SEDIMENT CONTROL NOTES

1. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED PRIOR TO STUMP REMOVAL AND CONSTRUCTION. STABILIZATION OF ALL REGRADED AND SOIL STOCKPILE AREAS WILL BE INITIATED AND MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
2. SEDIMENT REMOVED FROM EROSION CONTROL STRUCTURES WILL BE DISPOSED OF IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THIS PLAN. ALL straw BALES OR SILT FENCE RETAINING SEDIMENT OVER 6" HIGH SHALL HAVE THE SEDIMENT REMOVED AND ALL DAMAGED EROSION CONTROLS REMOVED AND REPLACED.
3. THE CONTRACTOR WILL BE ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER TOWN AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY. THE OWNER SHALL BE RESPONSIBLE FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND HAUL ROADS. CONTRACTOR SHALL CONTROL DUST TO PREVENT A HAZARD TO TRAFFIC ON ADJACENT ROADWAYS.
5. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN THIRTY (30) DAYS AFTER LAND DISTURBANCES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZE SOILS. OUTSIDE OF THE GROWING SEASON, ONLY WOOD MULCH SHALL BE USED.
6. STRAW BALES SHALL BE USED ONLY AS A TEMPORARY MEASURE. WHERE CONTROL MEASURES WILL BE REQUIRED FOR LONGER THAN SIXTY (60) DAYS, FILTER FABRIC SHALL BE USED.
7. INSPECTION – A CERTIFIED PROFESSIONAL EROSION AND SEDIMENT CONTROL PERSONAL OR ENGINEER SHALL INSPECT ALL DISTURBED AREAS OF THE CONSTRUCTION ACTIVITY THAT HAVE NOT BEEN FINALLY STABILIZED, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE AT LEAST ONCE EVERY WEEK AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.25 INCH OR GREATER. INSPECTION REPORTS SHALL BE SUBMITTED TO THE OWNER WEEKLY, AND TO THE INLAND WETLANDS AGENT AND THE PLANNING & ZONING COMMISSION MONTHLY. WHERE SITES HAVE BEEN FINALLY STABILIZED, SUCH INSPECTION SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH FOR THREE MONTHS. CONTROLS SHALL BE CLEANED, REPAIRED, AND OR REPLACED AS REQUIRED. ANY DAMAGED CONTROLS SHALL BE REPAIRED IMMEDIATELY.
8. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND MINIMIZE THE TIME EARTH MATERIALS ARE EXPOSED BEFORE POROUS ASPHALT AND STONE IS INSTALLED.

OPERATION & MAINTENANCE PLAN DURING CONSTRUCTION

A SUGGESTED OPERATION AND MAINTENANCE (O&M) PLAN FOR DURING CONSTRUCTION IS DESCRIBED AS FOLLOWS:

1. OWNER SHALL BE RESPONSIBLE FOR ALL OPERATION AND MAINTENANCE OF THE SITE.
2. NO EARTHWORK ACTIVITIES SHALL COMMENCE UNTIL SILT FENCE AND STRAW BALES HAS BEEN INSTALLED. SILT FENCE AND STRAW BALES SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS.
3. AREAS LEFT EXPOSED TO EROSION FOR MORE THAN SEVEN DAYS SHALL BE ROUGH GRADED AND TEMPORARILY STABILIZED. AREAS DISTURBED BUT INACTIVE FOR MORE THAN THIRTY DAYS SHALL BE TEMPORARILY SEEDED.
4. EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED UNTIL SUCCESSFUL ESTABLISHMENT OF GROUND COVER.
5. STAGING OF MATERIALS OR LAY DOWN AREAS SHALL BE LOCATED WITHIN THE FORMERLY PAVED OR DEVELOPED SURFACES.
6. PAVED AREAS SHALL BE KEPT FREE OF SEDIMENT, AND SHALL BE CLEANED PERIODICALLY AS REQUIRED BY CONSTRUCTION ACTIVITIES.
7. TEMPORARY SOIL STOCKPILES SHALL BE LOCATED WITHIN AREAS CONSISTING OF FORMERLY PAVED OR DEVELOPED SURFACES, AND WILL BE MOVED AS NECESSARY TO ACCOMMODATE ONGOING WORK.
8. SEDIMENT STOCKPILES SHALL HAVE A SIDE SLOPE OF NO GREATER THAN 2:1. ALL STOCKPILES SHALL BE ROUGH GRADED OR MAINTAIN A ROUGHENED SURFACE TO PREVENT EROSION. STOCKPILES THAT ARE NOT TO BE USED WITHIN 7 DAYS SHALL BE SEEDED AFTER FORMATION OF STOCKPILE AS TO PREVENT EROSION. straw BALE BARRIER AND SILT FENCE SHALL BE INSTALLED AROUND STOCKPILE AREA APPROXIMATELY 10 FEET FROM TOE OF SLOPE.
9. THE CONTRACTOR IS RESPONSIBLE TO INSPECT AND REPAIR EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED TO PREVENT DAMAGE OR SEDIMENTATION.
10. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES.

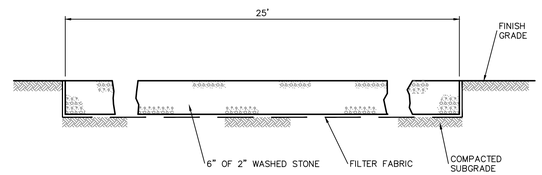


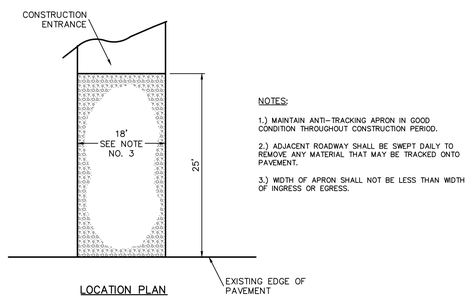
SILT FENCE NOTES:

1.) INSTALL SILT FENCE & WOOD STAKES AS RECOMMENDED BY MANUFACTURER.

2.) SYNTHETIC FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE FILAMENTS AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE SPECIFICATIONS.

1 SILT FENCE
SCALE: N.T.S.





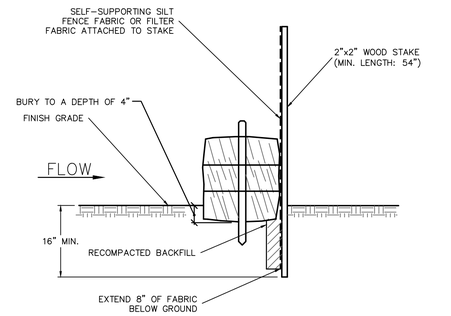
NOTES:

1.) MAINTAIN ANTI-TRACKING APRON IN GOOD CONDITION THROUGHOUT CONSTRUCTION PERIOD.

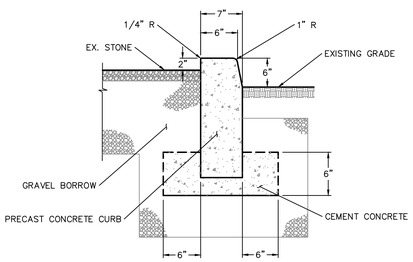
2.) ADJACENT ROADWAY SHALL BE SWEPT DAILY TO REMOVE ANY MATERIAL THAT MAY BE TRACKED ONTO PAVEMENT.

3.) WIDTH OF APRON SHALL NOT BE LESS THAN WIDTH OF INGRESS OR EGRESS.

2 CONSTRUCTION ENTRANCE
SCALE: N.T.S.



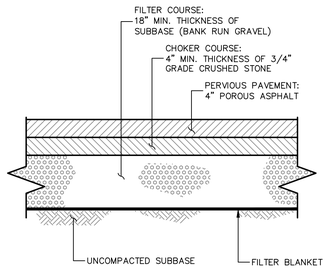
3 SILT FENCE BACKED W/ STRAW BALES
SCALE: N.T.S.



NOTES:

1. 1 INCH DEEP BEVELED JOINT AT TOP AND FACE OF CURB.
2. FULL DEPTH EVERY 10 FEET. 1/2 INCH EXPANSION JOINT AND FILLER EVERY 30 FEET.
3. 1/2 INCH EXPANSION JOINT AND FILLER WHEN CURB IS ADJACENT TO CONCRETE SIDEWALK.

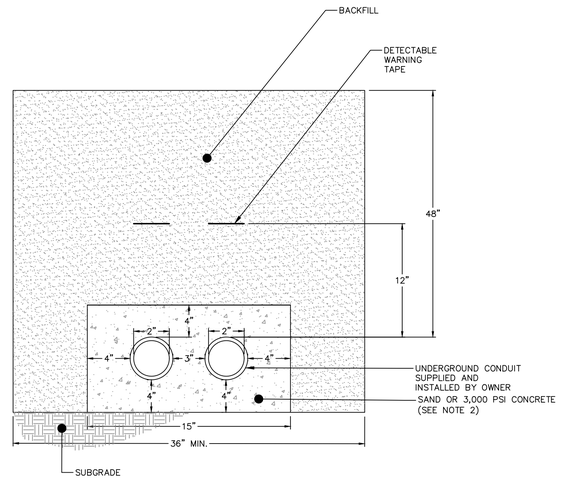
4 PRECAST CONCRETE CURB
SCALE: N.T.S.



NOTE:

BOTTOM OF THE STONE IN THE RESERVOIR COURSE MUST BE COMPLETELY FLAT.

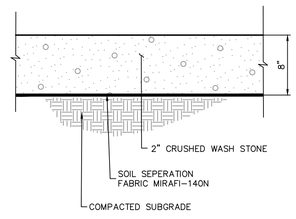
5 POROUS ASPHALT TYPICAL SECTION
SCALE: N.T.S.



NOTES:

1. INSTALL SAND OR CR CONCRETE AND BACKFILL IN ACCORDANCE WITH SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT REGULATIONS.
2. BACKFILL WITH CONCRETE UNDER AREAS THAT WILL HAVE VEHICULAR TRAFFIC (E.G., ROADS, DRIVEWAYS, PARKING LOTS, EQUIPMENT ACCESS ROUTES, ETC.). EXTEND CONCRETE 2' PAST EDGE OF TRAVELED WAY.
3. COORDINATE WITH SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT PRIOR TO INSTALLATION.

6 UNDERGROUND CONDUIT TRENCH
SCALE: N.T.S.



7 2" CRUSHED WASHED STONE TYPICAL SECTION
SCALE: N.T.S.

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SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT
CONSTRUCTION DETAILS
COLLEGE STREET
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
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South Hadley Electric Light Department

Old Lyman Road Construction Specifications – Attachment C2

Bid # 2020 – 1A

SHELD – Telecom Substation Improvements at Old Lyman Road

BID SET

South Hadley Electric Light Department

South Hadley, Massachusetts

July 1, 2020

1550 Main Street, Suite 400
Springfield, MA 01003

TABLE OF CONTENTS

END OF SECTION

SECTION 00 01 15 – LIST OF DRAWINGS

C0.00 Cover Sheet

C1.00 Existing Conditions Plan

C1.10 Site Preparation Plan

C1.20 Site Layout Plan

C1.30 Site Grading Plan

C1.40 Site Utility Plan

C1.45 Landscape Plan

C3.00 Construction Details

C3.01 Construction Details

C3.02 Construction Details

END OF SECTION

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes furnishing, placing, and maintaining temporary sediment control measures as shown on the Drawings, as directed by the Engineer, and where necessary to reduce sediment content of runoff. Control measures are to remain in place until after completion of construction. Measures include the following:
   1. Construction entrance.
   2. Filter Fabric/Silt fence.
   3. Sediment Control bales.
   4. Catch basin inserts.
   5. Dust control.
      a. Conduct construction operations and activities to minimize the creation and dispersion of dust. If the Engineer determines that water and or calcium chloride is required for more effective dust control, provide such measures at no additional cost.

B. Related Sections include the following:
   1. Section 31 10 00 Site Clearing
   2. Section 31 20 00 Earth Moving
   3. Section 32 92 19 Lawns and Grasses

1.2 SUBMITTALS

A. Product Data for the Following:
   1. Filter fabric and geotextiles for each application.
   2. Catch basin inserts.
   3. Silt Fence

B. Certificates of Compliance:
   1. Filter fabric and geotextiles for each application.
   2. Catch basin inserts.
   3. Gravel base.
   4. Crushed stone.
   5. Calcium chloride.

C. Drawings
   1. Erosion Control Plan Showing all measures within the extent of work.

1.3 QUALITY ASSURANCE

A. Latest Version Standard Specifications: "The Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges" and supplements.

B. Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas" prepared by MADEP.

PART 2 - PRODUCTS

2.1 CONSTRUCTION ENTRANCE

A. Stone: Standard Specifications, Article M2.01.1.

B. Geotextile: Non-woven geotextile, conforming to the following.

2.2 FILTER FABRIC/SILT FENCE

A. Synthetic Filter Fabric: Woven geotextile, 36 inches maximum height, conforming to the following:

Properties	Requirement	Unit
Grab Tensile Strength (ASTM D4632):	124	Lbs
Grab Tensile Elongation (ASTM D4632):	15	Percent
Puncture Strength (ASTM D4833):	65	Lbs
Flow Rate (ASTM D4491):	20	Gal/Min/Sq. Ft.
UV Resistance(at 500 hours) (Retained strength) (ASTM D4355):	80	Percent

B. Product and Manufacturer:
1. ProPex 2130 by Amoco Fabrics and Fibers Company, Austell, GA.
2. Mutual MISF 1855 by Mutual Industries, Inc., Philadelphia, PA.
3. Or approved equal.

C. Posts
1. Hardwood Stakes: 2-inch by 2-inch by 54-inch minimum.

D. Silt Fence Fasteners: Staples, tie wires or hog rings, as recommended by manufacturer.
1. Staples: Heavy-duty wire, 1-inch long minimum.

2.3 SEDIMENT CONTROL BALES

A. Bale Material: Straw, bound by twine or wire, weighing 40 to 120 pounds per bale.

B. Hardwood Stakes: 2-inch by 2-inch by 36-inch minimum.

2.4 CATCH BASIN INSERTS

A. Regular Flow Silt Sacks: Woven polypropylene that meets the following:

Properties	Test Method	Units
Grab Tensile Strength	ASTM D4632	300 Lbs
Grab Tensile Elongation	ASTM D4632	25 Percent
Puncture Strength	ASTM D4833	120 Lbs
Trapezoid Tear	ASTM D4533	120 Lbs
Flow Rate	ASTM D4491	40 Gal/Min/Sq. Ft.
Permittivity	ASTM D4491	0.55 Sec-1
Mullen Burst	ASTM D3786	800 psi
UV Resistance(at 500 hours) (Retained strength)	ASTM D4355	80 Percent
Apparent Opening Size	ASTM D4751	#40 US Sieve

1. Manufacturer: ACF Environmental, 1801-A Willis Road, Richmond, VA 23237 (800-844-9223),
2. Or approved equal.

2.5 DUST CONTROL

A. Calcium Chloride: ASTM D98, Type 1 or Type 2.

B. Water: Potable.

PART 3 - EXECUTION

3.1 GENERAL

A. Minimize environmental damage during construction. Prevent discharge of fuel, oil, lubricants, and other fluids. Mitigate effects of discharge.

B. Install erosion and sediment control measures prior to clearing, demolition or construction.

C. Construct erosion and sediment control measures in accordance with standards and specifications of the "Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas", municipal regulations, and as follows:
1. Attend a preconstruction meeting with the Engineer, to review permit conditions and construction methods.

2. Provide additional sedimentation and erosion controls as required by municipal to address field conditions.
3. Do not discharge turbid water from dewatering to inland wetlands or watercourses.
4. Weekly and prior to any anticipated rain event, inspect site. Ensure that erosion controls are properly maintained and functioning.
5. Supply a 24-hour contact name and number as part of the erosion control plan.

D. Install additional control measures, if deemed necessary by the State, Municipality, Authorities Having Jurisdiction, or Owner.

E. Implement and maintain the Erosion and Sediment Control Plan. Inform parties engaged on the construction site of the requirements and objectives of the plan. Notify the proper municipal agency of transfer of this responsibility.

F. Protect catch basins with erosion control bales throughout construction until disturbed areas are stabilized.
1. Remove and dispose of sediment from control structures.

G. Control dust and wind erosion. Control dust to prevent a hazard to traffic on adjacent roadways. Dust control includes sprinkling of water and uniform application of calcium chloride on exposed soils and haul roads.

H. Where control measures are required for longer than 60 days, use silt fence instead of straw bales.

I. Cut Areas
1. Establish an erosion control line (straw bale check or filter fabric) at toe of slope in cut areas and slope stabilization with mulch or grass within 30 days of start of cut operations.

J. Fill Areas
1. Establish an erosion control line (woodchip berm or filter fabric) approximately 10 feet from toe of slope of proposed fill areas prior to beginning fill installation.
2. Initiate slope stabilization with mulch or grass within 30 days of start of fill installation.

K. Within 7 days of completing slope construction, stabilize slopes with vegetation or matting to minimize exposure.

L. Stockpiles
1. Side Slopes: 2:1 maximum.
2. Surround stockpiles by a silt fence backed with sediment control bales.
3. Stabilize stockpiles left bare for more than 7 days with temporary vegetation or mulch.
4. Cover to prevent windblown dust.

M. Final Grading
1. If final grading is delayed for more than 30 days after land disturbances cease, stabilize soils with temporary vegetation or mulch.

N. Planting Season for Temporary Vegetation
1. March 1 to June 15 and August 1 to October 1.
2. After September 15, stabilize areas with straw bale check, filter fabric, or woodchip mulch.

O. Areas to Be Left Bare Prior to Finished Grading and Seeding
1. Within Planting Seasons
   a. Temporarily seed with Perennial Ryegrass
   b. Apply at a rate of 2 pounds per 1000 sq. ft. at a depth of 1/2 inch.
   c. Where grass predominates, fertilize according to a soil test at a minimum application rate of one pound per acre.
2. Outside of Planting Seasons
   a. Apply air-dried wood chip mulch, free of coarse matter.
   b. Apply at a rate of 185 to 275 pounds per 1000 sq. ft.

3.2 CONTROL SYSTEMS

A. Construction Entrance
1. Install at indicated site entrance locations.

B. Silt Fence
1. Install fencing at location as shown on the Drawings or where directed by the Engineer. Maintain pitch of 2 to 20 degrees, with inclination toward potential silt source.
2. Install bottom 8 inches of fabric by trenching and burying the fabric into the notched ground.
3. Drive posts into ground a minimum of 18 inches.
4. Locate fabric splices at posts only. Provide 6-inch overlap and seal.

C. Sediment Control Bales
1. Install at locations as shown on the Drawings or where directed by the Engineer. Place bales lengthwise with ends tight abutting one another. Install bales with bindings located on the sides.
2. Entrench bales 4 inches and backfill. Place backfill toward potential silt source.
3. Secure in place with 2 stakes per bale and insert straw in voids between bales.

D. Catch Basin Inserts
1. Remove catch basin grate, insert silt sack, and secure in place by replacing grate.

3.3 DUST CONTROL

A. Apply water and calcium chloride uniformly over the surface when dust becomes a nuisance or when directed by the Engineer. Provide shut-off valve in convenient location on water truck, to allow for regulating water flow.

3.4 FIELD QUALITY CONTROL

A. Construction Entrance Maintenance
   1. Maintain in good condition throughout construction period.
   2. Sweep adjacent roadways daily to remove tracked material from pavement.

B. Silt Fence and Sediment Control Bale Maintenance
   1. Inspect control system immediately after each rainfall and daily during prolonged rainfall. Make repairs immediately.
   2. Remove and dispose of accumulated sediments when sediment reaches approximately one-third the height of the control system, or when directed by the Engineer.
   3. Replace control system promptly if fabric decomposes or system becomes ineffective prior to the expected usable life.
   4. Maintain or replace system until no longer necessary for the intended purpose.

C. Catch Basin Insert Maintenance
   1. Inspect after each major precipitation event. Inspect every two weeks if no major rain events have occurred.
   2. Remove, clean, and reinstall silt sack when sediment accumulates to half capacity of sack.

3.5 REMOVAL

A. Remove and dispose of control systems after area stabilizes with new growth, or when directed by the Engineer.

END OF SECTION

SECTION 31 10 00 - 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. Protecting existing trees and other vegetation to remain.
2. Removing existing trees and other vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, removing site utilities, and abandoning site utilities in place.
7. Protect existing site improvements and utilities to remain.
8. Remove, stockpile, and protect existing site improvements.

B. Related Sections:

1. Section 01 57 13 Temporary Erosion and Sedimentation Control

1.3 DEFINITIONS

A. Finished Grade: Elevation of finished surface.

B. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

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

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is 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 more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

E. Landscape Topsoil: Proposed upper "A" horizon of soil in landscape areas that may or may contain a large proportion of Topsoil. All topsoil shall be imported from off site, tested and amended if necessary to meet soil standards.

F. Landscape Soil Profile: Proposed Landscape Soil profile made up of amended Subgrade ("C" horizon), Landscape Subsoil ("B" horizon), Landscape Topsoil ("A" horizon), and Mulch layer ("O" horizon).

G. Amended Subgrade: Surface or elevation remaining after completing excavation, filling or backfilling. Subgrade resulting from Earth Moving may or may not be suitable for plant growth and shall be amended by the Contractor to ensure it functions as the "C" horizon for the proposed landscape.

H. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

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

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

1.4 MATERIAL OWNERSHIP

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

1.5 INFORMATIONAL 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 videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Refer to section 01 78 39 Project Record Documents.

1.6 QUALITY ASSURANCE

A. Preconstruction Meeting: Conduct meeting at Project site with Engineer and on-site supervisor.

1.7 PROJECT 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 traffic ways if required by Owner or authorities having jurisdiction.
3. Provide temporary signage to guide construction traffic.

B. Protect-In-Place Existing Site Improvements: Support and protect in place existing site improvement. Items include pipes, poles, wires, fences, curbing, property line marker, build foundations, and other structures.

1. Restore items promptly; do not leave until end of construction.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises, coordinate with engineer and Owner.

D. Utility Locator Service: Call Dig-Safe 811 or 1-888-DIG-SAFE a minimum of 72 hours prior to construction for area where Project is located before site clearing

1. Coordinate with appropriate Utility companies, and appropriate Agencies including municipal agencies, and pay for permits, fees licenses, etc., for utility service work, as necessary.
2. Utility providers for the project site include:

   Water, Sewer & Storm: Town of South Hadley

   Gas: Columbia

   Electric: South Hadley Electric Light Department

   Telecom: Verizon

E. Do not commence site clearing operations until temporary tree and plant protection measures are in place.

F. Do not direct vehicle or equipment exhaust toward tree and plant protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near tree and plant protection zones and organic mulch.

H. Do not commence site clearing operations until temporary erosion and sedimentation control measures, specified in Section 01 57 13 Erosion and Sedimentation Control, are in place. Coordinate all work and secure necessary permits within State right-of-ways with the Commonwealth of Massachusetts DOT, as required.

I. 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.

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

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer.

1. Use coating with a VOC content of 420 g/L (3.5 lb./gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

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.

2. Protect existing site features and structures as shown on plans. Any perimeter damaged or removed during construction must be replaced in kind.

C. Locate and clearly identify trees, shrubs, and other vegetation to remain Tie a 1-inch blue-vinyl tape around each tree trunk at 54 inches above the ground.

D. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.2 EXCAVATION AROUND EXISTING TREES AND PLANTS

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.3 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

B. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.

C. Cut Ends: Do not paint cut root ends.

D. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.

E. Cover exposed roots with burlap and water regularly.

F. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

G. Root Pruning at Edge of Protection Zone: Prune roots 12 inches outside of the protection zone, by cleanly cutting all roots to the depth of the required excavation.

H. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.4 EXISTING UTILITIES

A. Contractor will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor. Allow for a minimum of two (2) weeks' notice for utility shut off requests.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

1. Fill abandoned culvert with structural fill at locations shown on plans.
2. Fill all catch basin and drainage structure that are to be abandoned in place with sand. Cap all pipes in structure.

D. 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 Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

F. Removal of underground utilities is included in earthwork sections and with applicable, electrical, and utilities sections.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, individual branches, 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. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.
5. Prune trees and other vegetation only as necessary to complete work

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.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 6 inches 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 more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. 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 protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.
5. Do not allow stockpile to remain for more than a year.

3.7 SITE IMPROVEMENTS

A. Remove existing above and below grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gravel parking, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along the line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
   a. Do not mix excavated pavement with other excavated materials
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 RESTORATION

A. Repair or restore existing site improvements and vegetation to remain, which is damaged by construction operation, to existing conditions or better as determined by the Engineer, at no additional cost to the Owner.

3.9 REMOVE AND STOCKPILE

A. Refer to site plans for items to be removed, stockpiled and returned to owner. Stockpile items on-site, and protect. If damaged replace in-kind at contractors expense.

3.10 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.

Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 31 20 00- 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.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for walks, pavements, lawns, and plantings.
2. Excavating and backfilling for structures, to the lines and grades shown on the Drawings.
3. Subbase course for structures, roads, walks, and pavements.
4. Base course for hot-mix asphalt paving.
5. Base course for cement concrete paving.
6. Excavating and backfilling trenches for buried utilities and pits for buried utility structures.
7. When directed by the Engineer, backfilling with additional gravel fill areas excavated of buried construction debris and unsuitable material.
8. Disposal of unsuitable material.
9. Disposal of surplus suitable material, if required.

B. Related Sections include the following:

1. Section 01 57 13 Temporary Erosion and Sedimentation Control
2. Section 31 10 00 Site Clearing
3. Section 31 12 16 Asphalt Paving
4. Section 32 30 53 "Misc. CIP Concrete"
5. Section 32 92 00 Lawns and Grasses
6. Section 32 93 00 "Plants"

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill trench, structure or pit excavations.

1. Initial Backfill: Backfill placed below footings, slabs, pavements, against walls, and 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. Compaction: The tamping and rolling of all backfill placed in uniform horizontal layers not exceeding a defined un-compacted lift thickness.

C. "In-the-dry": In-situ moisture content of no more than two percentage points above the optimum moisture content.

D. Proof-rolling: The tamping and rolling of all subgrades and processed material not exceeding a defined un-compacted lift thickness.

E. Unsuitable material: Material containing vegetation or organic material, such as mulch, peat, organic silt, topsoil sod, deleterious material, and/or particles greater than 4 inches in diameter that is not satisfactory for use as determined by the Engineer.

F. Base Course: Layer placed between the subbase course and bituminous concrete paving.

G. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

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

I. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work. All additional excavation required to install per OSHA standards at no additional cost(i.e. trench box, sloping, etc. for all utilities and site improvements including but not limited to fence, fence posts, sign posts, bollards, concrete step footings, retaining walls, bleacher footings, ground mounted sign, retaining and sitting wall footings, flag pole footings).

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

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

K. Rock: Rock material in beds, ledges, un-stratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cubic yard for bulk excavation

or 3/4 cubic yard for footing, trench, and pit excavation, that cannot be removed by rock excavating equipment, without systematic drilling, ram hammering, ripping, or blasting, when permitted; and that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches.

L. 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.

M. Subbase Course: Layer or layers placed between the subgrade and base course for bituminous concrete paving, or layer placed between the subgrade and a concrete pavement or walk.

N. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

O. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Each type of warning tape.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated. Prepare separate reports for each type and application of borrow and or fill material.

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.
3. Origin of material.
4. Classification and laboratory compaction curve for on-site soil material, in accordance with the above requirements, when requested by the Engineer.

C. Submit, in an airtight container for the testing laboratory, a 50-pound sample of each type of off-site fill material that is to be used at the site. Submit samples a minimum of two week prior to use of proposed material at the site. Submit samples to the testing laboratory (copy of these transmittal forms shall be simultaneously sent to Engineer) or if no testing laboratory then the Engineer shall be the recipient of the samples. Use of these proposed materials by the Contractor prior to testing and approval shall be at the Contractor's risk.

D. The Engineer will be responsible for the approval or rejection of the suitability of all materials.

E. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the project requires approval of the Owner or Engineer.

F. For use of geotextile fabrics or geogrids, submit manufacturer's product data including material's properties for approval by the Engineer.

G. For Record Purposes.

1. Excavation Protection System: Proposed system and design data; including certification by the qualified professional engineer responsible for their preparation.

H. 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.

1.5 QUALITY ASSURANCE

A. The Contractor shall retain and pay for the services of an independent testing and inspection firm and/or a Geotechnical Consultant to perform on-site observation and testing during the various phases of the construction operations. The Owner reserves the right to modify or waive the services of the independent testing and inspection firm and/or the Geotechnical Consultant. The services of an independent testing firm and/or Geotechnical Consultant may include, but not necessarily be limited to, the following:

1. Observation during excavation of structure and controlled fill areas.

2. Laboratory testing and analysis of fill materials as specified herein and proposed by the Contractor for incorporation into the Work.

3. Observation of construction and performance of water content, gradation and compaction tests at a frequency and locations that the independent testing and inspection firm and/or the Geotechnical Consultant may require. The results of these tests will be submitted to the Owner, Engineer, and Contractor on a timely basis so that action can be taken to remedy indicated deficiencies. During the course of construction, the independent testing and inspection firm and/or the Geotechnical Consultant will advise the Owner in writing, if at any time in their opinion, the Work hereunder is of unacceptable quality. Failure of independent testing and inspection firm and/or the Geotechnical Consultant to give notice, shall not excuse the Contractor from latent defects discovered in his work.

B. The Contractor shall make provisions for allowing observations and testing of Contractor's work by the independent testing and inspection firm and/or the Geotechnical Consultant.

C. The presence of the independent testing and inspection firm and/or the Geotechnical Consultant does not include supervision or direction of the actual work of the Contractor, and his employees or agents. Neither the presence of the independent testing and inspection firm and /or the Geotechnical Consultant, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

D. Costs related to retesting due to unacceptable qualities of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

E. MassDOT Spec: Commonwealth of Massachusetts, Massachusetts Department of Transportation, Standard Specifications for Highways and Bridges.

1.6 PROJECT 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. If required, a traffic management plan should be submitted for approval by engineer and owner.

3. Implement traffic management plan as shown in this project plan set, per the William's Master TMP and as advised by the Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Engineer.

C. Utility Locator Service: Notify Dig Safe for area where Project is located before site clearing.

1. Coordinate with appropriate Utility Companies, and appropriate Agencies including municipal agencies, and pay for permits, fees licenses, etc., for utility service work, as necessary.

D. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.
3. Contact "Dig Safe" before excavating. Proceed with excavation only after utility locator service completes marking of utility locations.

E. Coordinate with utility companies to shut off services if underground utility lines are active and are determined by contractor to be removed.

F. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 01 57 13 "Erosion and Sedimentation Control," are in place

G. Do not commence earth moving operations until plant-protection measures, specified in Section 01 56 39 "Temporary Tree and Plant Protection", are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Fill materials obtained from off-site sources that are DEP disposal sites shall be acceptable for use only when accompanied by an LSP opinion stating that the soils do not contain detectable quantities of oil and/or hazardous materials.

B. Structural Fill: Fill shall be used as fill beneath footings, pavement, and for other areas to the thicknesses and extent shown on the plans. It shall be a natural soil obtained from an off-site commercial source. It shall be free of ice, snow, roots, sod, rubbish, oil, hazardous material and other deleterious or organic matter. It shall be graded within the following limits:

U. S. Standard Sieve Size	Percent Finer by Weight
2 inch	100
½ inch	50-85
No. 4	40-75
No. 40	10-35
No. 200	0-8

C. Sand: Sand shall consist of clean, inert, hard, durable grains of quartz or other hard, durable rock, free from loam or clay, surface coatings and deleterious materials.

1. The allowable amount of material passing a No. 200 sieve as determined by AASHTO-T11 or ASTM D422 shall not exceed 10 percent by weight. The maximum particle size shall be 1/4-inch (i.e., 100 percent passing the No. 4 sieve).
2. In addition to the above criteria when sand is used for utility bedding it shall conform to the following gradation:

U. S. Standard Sieve Size	Percent Finer by Weight
No. 4	100
No. 8	80-95
No. 16	55-85
No. 50	0-35
No. 200	0-5

D. Processed Gravel for Base Course and Subbase: Processed Gravel shall meet the Massachusetts Highway Department (MassDOT) standard for highways and bridges mi .03.0 gravel borrow Type B.

1. This gravel will be tested for grain size-gradation-prior to placement to assure it meets this criteria.

U. S. Standard Sieve Size	Percent Finer by Weight
3"	100
½"	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-10

2. If the gravel satisfies this specification, then a proctor determination will be performed to obtain the maximum dry density for this material. Field Density Tests will be performed prior to placement of Hot Mix Asphalt to assure that a minimum of 95% of this maximum dry density has been obtained.

E. Ordinary Fill: Ordinary Fill shall be used as fill for excavations at depths greater than 12 inches (minimum) below footing, and pavements, and for other areas shown on the plans as required to achieve final grades. It shall be a natural soil obtained from an off-site commercial source. It shall be free of ice, snow, roots, sod, rubbish, oil, hazardous material and other deleterious or organic matter. It shall be graded within the following limits:

U. S. Standard Sieve Size	Percent Finer by Weight
2 inch	100
No. 10	30-90
No. 40	10-70
No. 200	0-15

F. Washed Crushed Stone:

1. ¼-Inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.6.

2. 3/4-inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.4

3. 2-inch: A clean, well-graded sand and gravel mixture free from frozen materials, vegetation, and other deleterious materials: MassDOT Spec, Section M2.01.1 and M2.01.2 with the following grading requirements:

U. S. Standard Sieve Size	Percent Finer by Weight
2 ½ inch	100
2 inch	95-100
1 ¼ inch	35-70
¾ inch	0-25

G. Trench Backfill: Processed Gravel, free of rock or gravel larger than 3 inches in any dimension.

H. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

I. Satisfactory Soils: Free of debris, waste, frozen materials, vegetation, clay and other deleterious matter; adequately graded for satisfactory compaction.

1. Topsoil: Native or imported topsoil, or surface soil modified to become topsoil; mixed with soil amendments. Free of masses of roots and individual roots more than 6 inches long and 1/2 inch in diameter, subject to approval by the Engineer.

2. Processed Gravel: Free of rock or gravel larger than 3 inches in any dimension.

J. Backfill and Fill: Satisfactory soil materials.

2.2 ACCESSORIES

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

1. Identifying Colors for Utilities:

a. Red: Electric.

b. Yellow: Gas, oil, steam, and dangerous materials.

c. Orange: Telephone and other communications.

d. Blue: Water systems.

e. Green: Sewer systems.

B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lbf; ASTM D 4632.

2. Tear Strength: 40 lbf; ASTM D 4533.

3. Puncture Resistance: 50 lbf; ASTM D 4833.

4. Water Flow Rate: 150 gpm per sq. ft.; ASTM D 4491.

5. Apparent Opening Size: No. 50; ASTM D 4751.

C. Geogrid: Punched polypropylene sheet, specifically manufactured as a soil reinforcement.

1. Tensar TriAx Geogrid TX-5 or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding or damaging Project site and surrounding area.

B. Protect excavations, backfills, fills and 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. Provide positive drainage of backfill and fill.

2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain dewatering until structures, pipes and appurtenances will not be damaged by surface or ground water. Maintain until dewatering is no longer required.

C. Obtain discharge permit for water discharging into storm drainage system or waterway. Remove particulate matter from pumped or drained water which discharges or flows into storm drainage system or waterway.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Excavation and Grades:

1. Place erosion control measures including the straw bales and silt fence prior to the intrusive work activities.

2. Contractor shall place or excavate fill materials to the grades shown on the Drawings.

3. Approximate limits of areas to be filled are shown on the Drawings.

4. Placement thickness and compaction criteria for Engineered Fills shall be in accordance with the Article 3.15 of this section.

5. Prior to the placement of any fill, the Contractor shall remove any unsuitable soils, as determined by the Engineer, and proof roll the existing site soils with at least four passes with a vibrating drum roller (weighing a minimum of 6,000 pounds).

B. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

C. Removal of Unsuitable Soil: Remove all unsuitable materials, including stumps, organic materials, demolition debris from and broken pavement, from proposed retaining wall area and under sidewalks, new pavements or related structures.

1. Excavated fill may be reused for site grading providing it meets soil material specifications

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

1. Excavate by hand 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. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavation for Underground Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

B. Foundation Excavation: over-excavate fill to full depth below footings including the influence zone

1. Influence zone: imaginary line extending downward and outward from footing edge at a 1H: 1V slope to firm bearing soils.

3.6 EXCAVATION FOR PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

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

B. Excavate trenches to uniform widths to provide a working 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: As indicated.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

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

D. 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 01 56 39 "Temporary Tree and Plant Protection."

3.8 SUBGRADE PREPARATION

A. Divert storm run-off away from construction site, reduce traffic in sensitive areas, and maintain an effective de-watering program to reduce sub-grade disturbance influenced by excavation methods, moisture, precipitation, groundwater control, and construction activities.

B. Over-excavate soils exhibiting weaving or instability and replace with a Free-Draining Sand-Gravel.

C. If unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed by Owner or Engineer.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

D. Subgrades will be compacted with a minimum of six (6) passes with a 10-ton vibratory roller. Do not proof roll wet or saturated subgrades.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

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 may be used when approved by Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Prevent windblown dust. Provide erosion control measures.

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

2. Stockpile excess cut materials to be placed on site as indicated on plans.

3.11 BACKFILL

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

1. Construction below finish grade.

2. Surveying locations of underground utilities for record documents.

3. Inspecting and testing underground utilities.

4. Removing concrete formwork.

5. Removing trash and debris.

6. Removing temporary shoring and bracing, and sheeting.

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 footing: backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 03 30 00 "Cast-in-Place Concrete."

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.

G. Place and compact final backfill of satisfactory soil material to final subgrade.

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

1. Install detectable warning tape over non-ferrous piping.

3.13 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 3 horizontal so fill material will bond with existing material.

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

D. Place soil fill on subgrade free of mud, frost, snow, or ice.

3.14 MOISTURE CONTROL

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

1. Do not place backfill or fill 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 BACKFILLS AND FILLS

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

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

1. In-place fill for below structural fill below footings compacted to a minimum of 95 percent.

2. Sand backfill against the rear of foundation walls and retaining walls backfill compacted to a minimum of 90 percent.

3. Structural fill, raise-in-grade fill and foundation backfill compacted to a minimum of 95 percent.

4. Processed gravel for pavement base course compacted to a minimum of 95 percent.

5. Ordinary fill for raise-in-grade fill below parking areas and non-bearing applications compacted to a minimum of 92 percent.

3.16 GRADING

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

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. Topsoil Finished Grade Adjacent to Walkway Surfaces: 1 inch below walkway finished grade.

C. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus ½ inch, however, not consistently in one direction.

2. Walks: Plus or minus 1/2 inch.

3. Pavements: Plus or minus 1/2 inch.

3.17 SUBBASE AND BASE COURSES

A. Under pavements, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.

2. Compact subbase and base courses 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 D 1557.

a. Place material to indicated thickness within 1/2 inch, plus or minus.

3. Shape subbase and base to required crown elevations and cross-slope grades.

4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.

5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.18 EXCAVATION AND BACKFILL FOR UTILITY WORK BY OTHERS

A. Contractor responsible for excavation, excavation support and backfill for electrical, telephone, data, and gas utility work to be done by others.

3.19 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

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

C. 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 Engineer.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or slab, but in no case fewer than three tests.

2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two test.

E. 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 to depth required; re-compact and retest until specified compaction is obtained.

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 specify 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 Engineer; reshape and re-compact.

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 the greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION - 32 12 16 – 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
   2. Porous asphalt pavement

B. Related Sections:
   1. Site 31 10 00 "Site Clearing"
   2. Section 31 20 10 Earth Moving
   3. Section 32 30 53 "Miscellaneous Cast-in-Place Concrete"

1.3 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

B. Hot mix asphalt Surface Course: The asphalt-aggregate top course of a hot mix asphalt pavement, sometimes called a wearing course.

C. Hot mix asphalt Intermediate Course: An intermediate course of a hot mix asphalt pavement, located between the hot mix asphalt surface course and the intermediate course.

D. Hot mix asphalt Wearing Surface: The asphalt-aggregate course of hot mix asphalt pavement atop the concrete bridge deck.

1.4 SUBMITTALS

A. Job-Mix Design Certification: For each job mix proposed for the Work, signed by the supplier.

B. Qualification Data: For hot mix asphalt supplier.

C. Material Certificates: For each paving material, signed by manufacturers.

D. Product Data: For each joint-sealant product indicated.

E. Field Data Rest Reports: For paving thickness, surface smoothness, and in-place density test results.

F. List of completed porous asphalt installations completed by installer within the last three (3) years.

G. Five (5) project references for applications in which Installer has installed porous asphalt.

1.5 QUALITY ASSURANCE

A. Codes and Standards - All materials, methods of construction and workmanship shall conform to applicable requirements of AASHTO ASTM Standards supplements and updates), or other standards as specified.

B. Installer Qualifications:

1. Installer must provide adequate number of skilled workers who are thoroughly trained and experienced in placement of porous asphalt pavement.

2. Installer must have successfully installed porous asphalt pavement at least five (5) locations within the previous three (3) years.

C. Show evidence of Asphalt manufacturer's authorized installer who is trained and approved for installation of porous asphalt required for this Project.

D. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

E. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MassDOT for asphalt paving work.
1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

F. Pre-installation Conference: Conduct conference at Project site.
1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

b. Review condition of subgrade and preparatory work.

c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Transport hot mix asphalt mixture in accordance with Section 460 of the Standard Specifications.

B. Deliver mixture within a tolerance of plus or minus 15 deg F of approved job mix formula temperature.

1.7 PROJECT 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 60 degrees F (15.6 degrees C).
   2. Tack Coat: Minimum surface temperature of 60 degrees F (15.6 degrees C).
   3. Asphalt Base Course: Minimum surface temperature of 40 degrees F (4.4 degrees C) and rising at time of placement.
   4. Asphalt Surface Course: Minimum surface temperature of 60 degrees F (15.6 degrees C) 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, sound; 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, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a.

B. Asphalt Cement: ASTM D 3381.

C. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70. Asphalt emulsion prime coat complying with MassDOT requirements.

D. Tack Coat: ASTM D 977 or emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Water: Potable.

2.3 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes, MassDOT designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the pavement thickness shown on the plans.

B. Porous Asphalt Pavement: Plant mixes in accordance with requirements specified in University of New Hampshire Stormwater Center (UNHSC) "Design Specifications for Porous Asphalt Pavement and Infiltration Beds."

1. Mix Materials

   a. Materials consist of modified performance grade asphalt binder (PGAB), coarse and fine aggregates, and optional additives such as silicone, fibers, mineral fillers, fatty amines, and hydrated lime. Materials shall meet the requirements of the NAPA's Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115 (2002), except where noted otherwise below or approved in writing by the Engineer.

2. Polymer Modified PGAB and Mix Designs

   a. Asphalt Binder: Polymer and/or fiber modified Performance Graded asphalt binder (PGAB) used in the production of Superpave Hot Mix Asphalt (HMA) mixtures. Ideally for maximum durability, the PGAB shall be two grades stiffer than that required for dense mix asphalt (DMA) parking lot installations, which is often achieved by adding a polymer and/or fiber.

   b. The PGAB polymer modifiers are to be either styrene butadiene rubber (SBR) or styrene butadiene styrene (SBS). SBS is typically reserved for large projects as terminal pre-blending is required. SBR is feasible for smaller projects as it can be blended at the plant or terminal blended. The quantity of rubber solids in the SBR shall typically be 1.5 to 3 percent by weight of the bitumen content of the mix.

3. Provide mixes with a history of satisfactory performance in geographical area where Project is located, or provide materials combined and graded to meet the composition limits by mass (weight) as shown in the following Table.

Sieve Size (inch/mm)	Percent Passing (%)
0.75/19	100
0.50/12.5	85-100
0.375/9.5	55-75

Sieve Size (inch/mm)	Percent Passing (%)
No.4/4.75	10-25
No.8/2.36	5-10
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	6 - 6.5%
Fiber Content by Total Mixture Mass	0.3% cellulose or 0.4% mineral
Rubber Solids (SBR) Content by Weight of the Bitumen	1.5-3% or TBD
Air Void Content (ASTM D6752/AASHTO T275)	16.0-22.0%
Draindown (ASTM D6390)*	$\leq$ 0.3 %
Retained Tensile Strength (AASHTO 283)**	$\geq$ 80 %
Cantabro abrasion test on unaged samples (ASTM D7064-04)	$\leq$ 20%
Cantabro abrasion test on 7 day aged samples	$\leq$ 30%

*Cellulose or mineral fibers may be used to reduce draindown.

**If the TSR (retained tensile strength) values fall below 80% when tested per NAPA IS 131 (with a single freeze thaw cycle rather than 5), then in Step 4, the contractor shall employ an antistrip additive, such as hydrated lime (ASTM C977) or a fatty amine, to raise the TSR value above 80%.

4. Course Depth and Class: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment 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. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt

surface has been repaired flush with adjacent asphalt prior to beginning installation of top course of asphalt.

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd.
   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with tack coat as outlined above. Then cover with-hot-mix surface layer compacted and finished flush with adjacent surfaces.

3.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
   3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.

   1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is

placed and after volatiles have evaporated.

2. Protect primed substrate from damage until ready to receive paving.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal. /sq. yd.
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 POROUS ASPHALT PAVEMENT

A. Crushed Stone: Refer to Section 31 20 00"Earth Moving".

B. Porous Asphalt Pavement:

1. Place geotextile filter fabric alongside slopes in accordance with manufacturer's recommendations.

2. Do not over compact base, subbase or reservoir courses.

3. Install porous asphalt in single lift.

3.6 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to 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 base course in number of lifts and thicknesses indicated.

2. Place hot-mix asphalt surface course in single lift.

3. Spread mix at minimum temperature of 250 deg F (121 deg C).

4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.

5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

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.

3.7 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. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
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.

3.8 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

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: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
2. Track Base Course Density: 95 percent or per manufacturer's recommendations.

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.

3.9 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.

2. 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: 1/8 inch.

3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances outlined above.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1,000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

G. Porous Asphalt Pavement: All requirements for standard bituminous concrete paving shall apply. In addition, perform testing in accordance with UNGWSC " Porous Asphalt Pavement and Infiltration Beds Design Specifications" including the following:

1. Hose Test: The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gpm over the surface, using a hose or other distribution devise. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. All applied water shall infiltrate directly without large puddle formation or surface runoff, and shall be observed by the Engineer.

3.11 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION - 32 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, concrete stairs, mixture design, placement procedures, and finishes.

1. Concrete Footings: chain link fence.

2. Steel Pipe Filled Concrete Bollard

B. Related Sections:

1. Section 31 20 00 "Earth Moving"

2. Section 32 32 12 "Chain Link Fences and Gates"

3.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Action Submittal:

1. Design Mixtures: For each concrete mixture.

1.4 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.

B. Comply with the following sections of ACI 301 (ACI 301M), unless modified by requirements in the Contract Documents:

1. "General Requirements."
2. "Formwork and Formwork Accessories."
3. "Reinforcement and Reinforcement Supports."
4. "Concrete Mixtures."
5. "Handling, Placing, and Constructing."
6. "Normal Weight Concrete."

C. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and formwork accessories according to ACI 301 (ACI 301M).

2.2 STEEL REINFORCEMENT

A. Recycled Content: Provide steel reinforcement with an average recycled content of steel products so that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, Type II Supplement with the following:
   a. Fly Ash: ASTM C 618, Class C or F.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregate: ASTM C 33, graded, 1-1/2-inch nominal maximum aggregate size.

C. Water: ASTM C 94/C 94M.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 RELATED MATERIALS

A. Vapor Retarder: Plastic sheet, ASTM E 1745, Class A or B.

B. Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick; or plastic sheet, ASTM E 1745, Class C.

C. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXTURES

A. Comply with ACI 301 or (ACI 301M) requirements for concrete mixtures, as applicable.

B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301 (ACI 301M), as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45.

3. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

4. Slump Limit: 4 inches, plus or minus 1 inch.

5. Air Content: Maintain within range permitted by ACI 301 (ACI 301M). Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

C. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate but not less than a rate of 1.0 lb/cu. yd.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116, and furnish batch ticket information.

B. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

C. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit.

2.9 STEEL PIPE FILLED CONCRETE BOLLARDS

1. Schedule 40 Steel pipe: complying with ASTM A 53/A 53M

2. Concrete fill shall be minimum 3000 psi

3. Paint Color: Dark Gray

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301 (ACI 301M).

3.2 EMBEDDED ITEMS

B. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR RETARDERS

A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal with manufacturers recommended adhesive or joint tape.

3.4 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

D. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.6 CONCRETE PLACEMENT

A. Comply with ACI 301 (ACI 301M) for placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding 1/2 inch (13 mm).

1. Apply to concrete surfaces not exposed to public view.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.8 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 (ACI 301M) for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during 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.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

B. Tests: Perform according to ACI 301 (ACI 301M).

3.11 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION

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.

1.2 SUMMARY

A. Section Includes:
   1. Chain-link fences.
   2. Gates: horizontal slide

B. Related Sections:
   1. Section 31 20 00 "Earth Moving"
   2. Section 32 30 53 "Miscellaneous Cast-in-Place Concrete"

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design chain-link fences and gates, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to [ASCE/SEI 7]
   1. Minimum Post Size: Determine according to ASTM F 1043 for framework up to 12 feet high, and post spacing not to exceed 10 feet
   2. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
      a. Material Group: Schedule 40 steel pipe

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
   1. Fence and gate posts, rails, and fittings.
   2. Chain-link fabric, reinforcements, and attachments.
   3. Accessories: Barbed wire
   4. Gates and hardware.
   5. Gate operators, including operating instructions.

6. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.
   1. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
   2. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For chain-link fences and gate framework indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of chain-link fence, operator, and gate, from manufacturer.

B. Product Test Reports: For framing strength according to ASTM F 1043.

C. Field quality-control reports.

D. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:
   1. Polymer finishes.
   2. Gate hardware.
   3. Gate operator.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing fence grounding. Member company of NETA or an NRTL.
   1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

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.

C. Mockups: Build mockups to set quality standards for fabrication and installation.
   1. Include 10-foot (3 m) length of fence and gates.

D. Preinstallation Conference: Conduct conference at the project site
   1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

2. Review sequence of operation for each type of gate operator.
3. Review coordination of interlocked equipment specified in this Section and elsewhere.
4. Review required testing, inspecting, and certifying procedures.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Faulty operation of gate operators and controls.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
   1. Fabric Height: 96 inches and as indicated on Drawings.
   2. Steel Wire Fabric: Wire with a diameter of 0.148 inch (3.76 mm)
      a. Mesh Size: 2 inches (50 mm)
      b. Zinc-Coated Fabric: ASTM A 392, Type II, [Class 1, 1.2 oz./sq. ft. (366 g/sq. m)] [Class 2, 2.0 oz./sq. ft. (610 g/sq. m)] with zinc coating applied after weaving.
      c. Polymer-Coated Fabric: ASTM F 668, Class 1 over zinc-coated steel wire.
         1) Color: Black, complying with ASTM F 934.
      d. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
   3. Selvage: Twisted top and knuckled bottom.

2.2 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043based on the following:
   1. Fence Height: 72 inches (1830 mm) and As Indicated on Drawings
   2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40

a. Line Post: 2.875 inches (73 mm) in diameter
b. End, Corner and Pull Post: 4.0 inches (102 mm) in diameter]

3. Horizontal Framework Members: Intermediate and top rails complying with ASTM F 1043.
   a. Top Rail: 1.66 inches (42 mm) in diameter
4. Brace Rails: Comply with ASTM F 1043.
5. Metallic Coating for Steel Framing:
   a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating per ASTM A 653/A 653M.
6. Polymer coating over metallic coating.
   a. Color: Match chain-link fabric complying with ASTM F 934.

2.3 TENSION WIRE

A. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with the following metallic coating:
   1. Type II, zinc coated (galvanized), with the following minimum coating weight:
      a. Matching chain-link fabric coating weight.
   2. Type III, Zn-5-Al-MM alloy with the following minimum coating weight:
      a. Matching chain-link fabric coating weight.

2.4 HORIZONTAL-SLIDE GATES

A. Manufacturer: Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY, 1-800-328-4283, or approved equal.
   1. Fortress Heavy Duty Cantilever Slide Gate
   2. 72" Ht.
   3. 20'' single panel opening
   4. Finish: Manufacturers standard galvanized steel with two-coat epoxy powder coating.
   5. Gate track system shall be keyed to interlock into gate frame member.
   6. Gate shall have a minimum counterbalance length of 50% opening width.
   7. Entire gate frame (including counterbalance section) shall include 2 adjustable stainless. or galvanized steel cables (minimum 3/16") per bay.
   8. Gate truck assemblies shall be tested for continuous duty and shall have precision ground and hardened components. Bearings shall be pre-lubricated and contain shock resistant outer races and captured seals.
   9. Gate truck assemblies shall be supported by a minimum 5/8" plated steel bolt with self-aligning capability, rated to support a 2,000 # reaction load.
   10. Hanger brackets shall be hot dipped galvanized steel with a minimum 3/8" thickness.
   11. Gate top track and supporting hangar bracket assemblies shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.

2.5 FITTINGS

A. General: Comply with ASTM F 626.

B. Post Caps: Provide for each post.
   1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

   1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches (152 mm) long.
   2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate rails in the fence line-to-line posts.

E. Tension and Brace Bands: Pressed steel

F. Tension Bars: Steel length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: [Steel, hot-dip galvanized after threading] rod and turnbuckle or other means of adjustment.

H. Barbed Wire Arms: Pressed steel or cast iron with clips, slots, or other means for attaching strands of barbed wire integral with post cap; for each post unless otherwise indicated, and as follows:
   1. Provide line posts with arms that accommodate top rail or tension wire.
   2. Provide corner arms at fence corner posts, unless extended posts are indicated.
   3. Type II, single vertical arm.

I. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
   1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
      a. Hot-Dip Galvanized Steel: 0.148-inch- (3.76-mm-) diameter wire[; galvanized coating thickness matching coating thickness of chain-link fence fabric].

J. Finish:
   1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.
      a. Polymer coating over metallic coating.

2.6 BARBED WIRE

A. Steel Barbed Wire: Comply with ASTM A 121, for two-strand barbed wire, 0.099-inch- (2.51-mm-) diameter line wire with 0.080-inch- (2.03-mm-) diameter, four-point round barbs spaced not more than 5 inches (127 mm) o.c.

1. Aluminum Coating: Type A.
2. Zinc Coating: Type Z, Class 3.

2.7 GATE OPERATORS

A. General: Provide factory-assembled automatic operating system designed for gate size, type, weight, and operation frequency. Provide operation control system with characteristics suitable for Project conditions, with remote-control stations, safety devices, and weatherproof enclosures; coordinate electrical requirements with building electrical system.
   1. Provide operator designed so motor may be removed without disturbing limit-switch adjustment and without affecting auxiliary emergency operator.
   2. Provide operator with UL approved components.
   3. Provide electronic components with built-in troubleshooting diagnostic feature.
   4. Provide unit designed and wired for both right-hand/left-hand opening, permitting universal installation.

B. Comply with NFPA 70.

C. UL Standard: Fabricate and label gate operators to comply with UL 325.

D. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1 and the following:
   1. Voltage: 120 V
   2. Enclosure: Manufacturer's standard.
   3. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
   4. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
   5. Phase: One

E. Gate Operators: Pedestal post mounted and as follows:
   1. Mechanical Slide Gate Operators:
      a. Duty: Heavy duty, commercial/industrial.
      b. Gate Speed: Minimum 45 feet (13.7 m) per minute
      c. Maximum Gate Weight: 800 lb (363 kg)
      d. Frequency of Use: 10 cycles per hour
      e. Operating Type: Roller chain, with manual release.
      f. Drive Type: Enclosed worm gear and chain-and-sprocket reducers, roller-chain drive.

F. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s). Activation of sensor(s) causes operator to immediately function as follows:
   1. Action: Stop gate in opening cycle and reverse gate in closing cycle and hold until clear of obstruction.
   2. Internal Sensor: Built-in torque or current monitor senses gate is obstructed.

3. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connect to control circuit using self-coiling cable Retain first subparagraph below for swing gates. For slide gates, retain first two subparagraphs. Retain third subparagraph for vehicular swing and slide gates complying with UL 325 or to suit Project; consider retaining for pedestrian gates.
   a. Where indicated on Drawings.
4. Photoelectric/Infrared Sensor System: Designed to detect an obstruction in gate's path when infrared beam in the zone pattern is interrupted.

G. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions.
   1. Type: Integral fail-safe release, allowing gate to be pushed open without mechanical devices, keys, cranks, or special knowledge

H. Accessories:
   1. Warning Module: Audio, Visual, light alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving; compliant with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.
   2. Battery Backup System: Battery-powered drive and access-control system, independent of primary drive system.
      a. Fail Safe: Gate opens and remains open until power is restored.
      b. Fail Secure: Gate cycles on battery power, then fail safe when battery is discharged.
   3. Instructional, Safety, and Warning Labels and Signs: According to UL 325
   4. Equipment Bases/Pads: Cast-in-place or precast concrete, dimensioned and reinforced according to gate-operator component manufacturer's written instructions and as indicated on Drawings.

2.8 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for 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 Engineer.

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 250 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
1. Install fencing on established boundary lines inside property line.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete 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.
   b. Concealed Concrete: Top 2 inches below grade to allow covering with surface material.
   c. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
3. Mechanically Driven Posts: Drive into soil to depth of 36 inches Protect post top to prevent distortion.

C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.

D. Line Posts: Space line posts uniformly at 96 inches o.c.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
   1. Extended along bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
   2. Extended along top of barbed wire arms and top of fence fabric for supporting barbed tape.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Intermediate and Bottom Rails: Install and secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches 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 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
   1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

M. Barbed Wire: Install barbed wire uniformly spaced as indicated on Drawings. Pull wire taut, install securely to extension arms, and secure to end post or terminal arms.

N. Barbed Tape: Comply with ASTM F 1911. Install barbed tape uniformly in configurations indicated and fasten securely to prevent movement or displacement.

3.5 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 GATE OPERATOR INSTALLATION

A. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.

B. Excavation for Support Posts, Pedestals and Equipment Bases/Pads: Hand-excavate holes for bases/pads, in firm, undisturbed soil to dimensions and depths and at locations as required by gate-operator component manufacturer's written instructions and as indicated.

C. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

3.7 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operator: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices, alarms, and limit switches.
   1. Hydraulic Operator: Purge operating system, adjust pressure and fluid levels, and check for leaks.
   2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   3. Test and adjust controls, alarms, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Lubricate hardware, gate operator, and other moving parts.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION

SECTION - 32 92 00 - LAWNS 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. This Section includes the following:

1. Seeding.

B. Related Sections include the following:

1. Section 31 10 00 Site Clearing
2. Section 31 20 00 Earth Moving

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of topsoil.

B. Topsoil: Native or imported topsoil, or surface soil modified to become topsoil; mixed with soil amendments. Free of masses of roots and individual roots more than 6 inches long and 1/2 inch in diameter, subject to approval by the Engineer.

C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath topsoil.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

C. Product Certificates: For soil amendments, fertilizers, and mulch, signed by product manufacturer.

D. Qualification Data: For landscape Installer.

E. Material Test Reports: For existing surface soil and imported topsoil.

F. Planting Schedule: Indicating anticipated planting dates for each type of planting.

G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent 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. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.7 SCHEDULING

A. 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. Spring Planting: April 1 to June 1.

2. Fall Planting: August 15 to October 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.8 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 60 days from date of Substantial Completion.

    a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn 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 lawn at a minimum rate of 1 inch per week.

D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of grass height. Remove no more than 40 percent 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 grass height of 2 to 3 inches.

E. Lawn Post-fertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb./1000 sq. ft. to lawn area.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

1. New Lawns: Valley Green Mix #1 or approved equal. Valley Green, USA Holyoke, MA 1-800-862-0089 www.valleygreenusa.com

Over Seeding for established turf: Valley Green Mix #2 or approved equal. Valley Green, USA Holyoke, MA 1-800-862-0089 www.valleygreenusa.com

New Loam Seed Mix	
Creeping Red Fescue	40%
Chewing Fescue	40%
Perennial Rye	20%

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, 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 or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

1. Provide lime in form of dolomitic limestone, with a minimum of 95 percent passing a No. 100 sieve.

B. Perlite: Horticultural perlite, soil amendment grade.

C. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through

3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

1. Organic Matter Content: 50 to 60 percent of dry weight.

    a. State of Connecticut, Department of Environmental Protection approved when derived from food and agricultural residues, animal manures, and sewage sludge.

B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 PLANTING ACCESSORIES

A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.6 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 18 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. 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 agency.

2.7 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, threshed straw of wheat, rye, oats, or barley.

B. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.8 TOPSOIL MIX

A. Topsoil Mix: Mix topsoil with soil amendments and fertilizers in quantities required by the Soil Test Report, Document 00 31 32.16.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

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 overspray.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 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 topsoil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend topsoil mix.

a. Delay mixing fertilizer with topsoil if planting will not proceed within a few days.

b. Mix lime with dry soil before mixing fertilizer.

2. Spread topsoil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if topsoil or subgrade is frozen, muddy, or excessively wet.

C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.

2. Loosen surface soil to a depth of at least of 6 inches. Apply soil amendments and fertilizers according to topsoil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.

4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, 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 tackifier.

2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1,500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.5 LAWN RENOVATION

A. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish lawn where settlement or washouts occur or where minor re-grading is required.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

D. Mow, dethatch, core aerate, and rake existing lawn.

E. Remove waste and foreign materials, including grass, vegetation, and turf, and legally dispose of them off Owner's property.

F. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

G. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 4 inches of existing soil. Provide new topsoil to fill low spots and meet finish grades.

H. Apply seed and protect with straw mulch as required for new lawns.

I. Water newly planted areas and keep moist until new lawn is established.

3.6 SATISFACTORY LAWNS

A. Satisfactory Seeded Lawn: 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 3 by 3 inches.

B. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.7 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.

C. Remove erosion-control measures after grass establishment period.

END OF SECTION

SECTION- 32 93 00 - PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Trees

B. Related Sections include the following:

1. Section 01 57 13 Temporary Erosion and Sedimentation Control
2. Section 31 10 00 Site Clearing
3. Section 31 20 00 Earth Moving
4. Section 32 92 00 Lawns and Grasses

1.2 DEFINITIONS

A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

B. 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.

C. Finish Grade: Elevation of finished surface of planting topsoil.

D. Planting Area: Areas to be planted.

E. 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. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

F. 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.

1.3 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.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.

B. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:

1. Manufacturer's certified analysis for standard products.

2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

D. Material Test Reports: For existing surface soil and imported topsoil.

1. Sieve analysis

2. Organic constituent analysis

3. Microorganism content

4. Acidity-alkalinity test (pH)

5. Soluble salts

6. Percentage tests for the following:

a. Nitrogen (N)
b. Phosphoric Acid (P_2O_5)
c. Potash (K_2O)

7. Percentages by volume for sand, silt, and clay.

E. Planting Schedule: Indicating anticipated planting dates for exterior plants.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent 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. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

2. Contractor shall supplement soil with amendments and additions at no additional cost as required to remedy any deficiencies indicated in tests and to meet laboratory recommendations.

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

F. Observation: Landscape Architect may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.
2. Notify Landscape Architect three days in advance of proposed delivery to site.

1.6 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, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, 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 delivery. Do not drop plants during delivery.

D. Handle planting stock by root ball.

E. Apply anti-desiccant 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 anti-desiccant at nursery before moving and again two weeks after planting.

F. 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.

G. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants trees in 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 with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 COORDINATION

A. 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 Plants:

a. Spring Planting: March 15 to May 15.
b. Fall Planting: September 15 to November 15.

2. Evergreen Plants:

a. Spring Planting: March 15 to June 15.
b. Fall Planting: August 15 to November 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

C. Coordination with Turfs: Plant trees and shrubs after finish grades are established and before planting turfs, unless otherwise acceptable to Landscape Architect.

1. When planting trees and shrubs after turfs, protect turf areas and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Warranty Period for Trees and Shrubs: One year from date of Substantial Completion.

2. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.

3. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

4. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

5. Warranty shall include edging failure which includes but is not limited to:
   a. Faulty performance
   b. Deterioration of metals, metal finishes and other materials beyond normal weathering.

1.9 MAINTENANCE

A. Trees and Shrubs: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

1. Maintenance Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TREE MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, 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 (19 mm) 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. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

D. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread to assure symmetry in planting.

E. Shade And Flowering Trees

1. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.

   a. Provide balled and burlapped or container-grown trees.

2. Small Flowering Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as indicated.

   a. Provide balled and burlapped or container-grown trees.

F. Evergreens

1. Form and Size: Normal-quality, well-balanced,evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

   a. Provide balled and burlapped or container-grown trees.

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 2 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

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

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

2. Topsoil Source: Import topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

1. Provide lime in form of dolomitic limestone, with a minimum of 95 percent passing a No.100 sieve.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Mature, stable, weed-free, and produced by aerobic decomposition of organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

1. Organic Matter Content: 50 to 60 percent of dry weight.

2. Compost feedstock may include, but is not limited to: agricultural, food or industrial residuals; class A biosolids as defined in the EPA CFR Title 40, Part 503; yard trimmings, or source-separated municipal solid waste. The product must not contain any visible refuse or other physical contaminants, substances toxic to plants, or over 5% sand, silt, clay or rock material by dry weight. The product shall possess no objectionable odors. The product must meet all applicable USEPA CFR, Title 40, Part 503 Standards for Class A biosolids. The moisture level shall be such that no visible water or dust is produced when handling the material.

B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

1. Product: "Bovung" or approved equal.

2.5 ORGANIC FERTILIZER

A. General: Controlled-release fertilizer composed of organic products and minerals, free of chemicals and manmade additives

1. Synthetic chemical fertilizers are not permitted.

2. Fertilizers containing petrochemical additives or that have been treated with pesticides or herbicides are not permitted.

B. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

C. Products Include:

1. Bonemeal: Finely ground raw bonemeal having a minimum analysis of one percent nitrogen and 11 percent phosphoric acid.

2. Fluid Fertilizer: "Algro" 14-7-4 low chlorine 40 percent organic root food as manufactured and supplied by Plant Food Chemical Company, Cranberry, New Jersey, or approved equal.

2.6 WATER

A. Water: Potable.

2.7 MULCHES

A. General: Free from noxious weeds, mold, pesticides, or other deleterious materials, and suitable as a top dressing of trees and shrubs.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded pine bark mulch.
2. Size Range: 3 inches maximum, 1/2 inch minimum.
3. Color: Natural.

2.8 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.

1. Product: "Wilt-Pruf" or equal.

B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4-inch- wide minimum, with stretch factor of 33 percent.

C. Mycorrhizal Fungi: Commercially prepared soluble endo mycorrhizae inoculant to improve the soil with fungi for a healthy living regime and better nutrient absorption. It shall contain a blend of Endo mycorrhizal spores such as Glomus aggregatum, G. etunicatum, G. clarum, G. deserticola, G. intraradices, G. monosporus, G. mosseae, Gigaspora margarita, and Paraglomus brasilianum.

2.9 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4.
2. Ratio of Loose manure to Topsoil by Volume: 1:4.
3. Weight of Lime, Bonemeal, Superphosphate, and Commercial Fertilizer per 1000 Sq. Ft.: As determined by Soil Test Report, Document 00 31 32.16.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plantings for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing plants from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations due to underground infiltration systems and when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Apply anti-desiccant to trees and shrubs using power spray to provide an adequate film over trunks, 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 anti-desiccant at nursery before moving and again two weeks after planting.

E. Spread topsoil to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if subgrade is frozen, muddy, or excessively wet.

3.3 TREE EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter.
2. Excavate pit to a depth to allow a 6-inch (150 mm) layer of topsoil beneath ball.

B. Subsoil removed from excavations may not be used as backfill.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

3.4 TREE PLANTING

A. Set planting stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

1. Remove burlap and wire baskets from tops of root balls and partially 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. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

3. Carefully remove root ball from container without damaging root ball or plant.

B. Organic Mulching: Apply 3-inch average thickness of organic mulch extending beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

C. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach with a coarse sisal twine without causing girdling. Do not nail or staple to tree. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.

3.5 TREE PRUNING

A. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Tree and shrub sizes indicated are sizes after pruning.

3.6 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.

3.7 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 Landscape 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 Landscape 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 Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in caliper size.
2. Provide one new tree(s) of 6-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
3. Species of Replacement Trees: Same species being replaced.

3.8 CLEANUP AND PROTECTION

A. During exterior planting, keep adjacent pavings 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. Protect plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.9 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

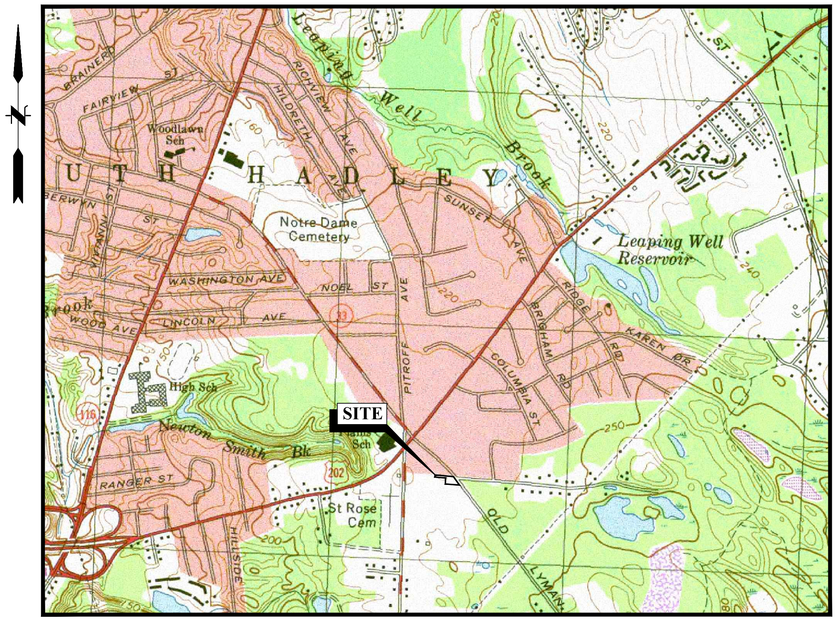
END OF SECTION

SHELD - TELECOM SUBSTATION UPGRADES

OLD LYMAN ROAD · SOUTH HADLEY · MASSACHUSETTS

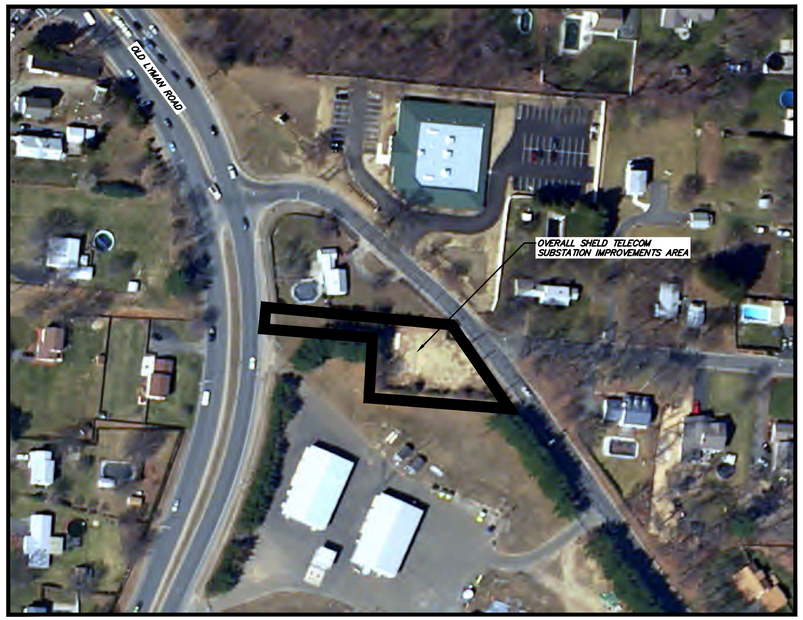
BID SET

JULY 1, 2020



LOCATION MAP

SCALE: 1" =1000'



LOCATION MAP

SCALE: 1" =100'

SHEET INDEX

PREPARED FOR

SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT

85 MAIN STREET
SOUTH HADLEY, MA 01075

PREPARED BY

FUSS & O'NEILL

1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

COMMONWEALTH OF MASSACHUSETTS
DANIEL F. DELANY
CIVIL
NO. 43477
REGISTERED PROFESSIONAL ENGINEER
7/8/2020

PROJ. No.: 20190284.A10
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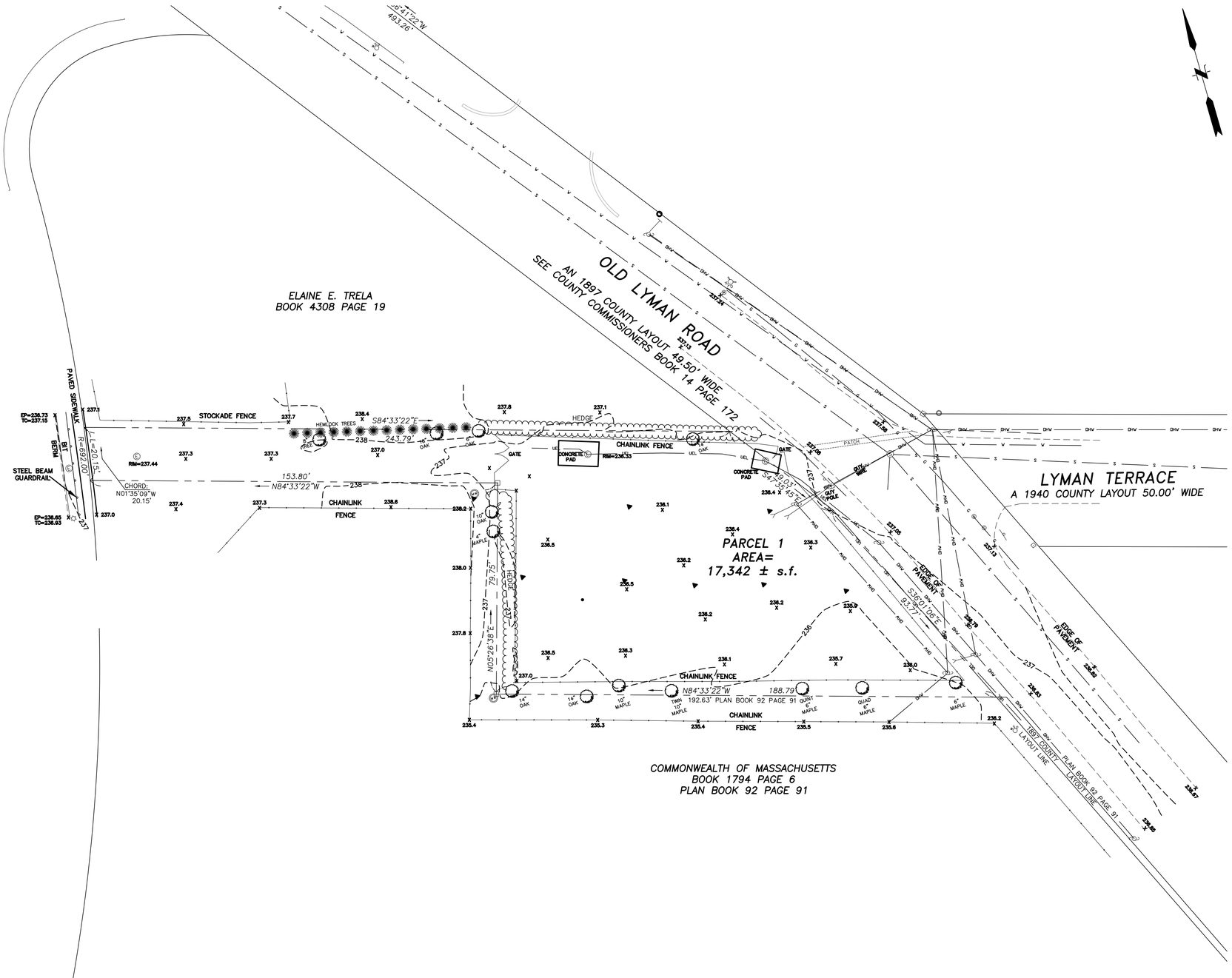

MAP REFERENCE

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN ARE BASED ON A PLAN ENTITLED: PLAN OF LAND IN SOUTH HADLEY, MASSACHUSETTS, SURVEYED FOR SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT, REVISED THROUGH: JUNE 9, 2015 PREPARED BY HERITAGE SURVEYS, INC., REGISTERED PROFESSIONAL LAND SURVEYORS, COLLEGE HIGHWAY & CLARK STREET, POST OFFICE BOX 1, SOUTHAMPTON, MASSACHUSETTS, JOB # 7300-150406, DWG # 7300SH01, MAP # 7300-150915.

GENERAL NOTES

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDINGS AND ADJACENT SITE ELEMENTS INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.
5. LOCATION OF UTILITIES SHOWN HEREON ARE THE RESULT OF SURFACE EVIDENCE AS LOCATED BY FIELD SURVEY, PLANS OF RECORD, INFORMATION FURNISHED BY THE RESPECTIVE UTILITY COMPANIES, AND OTHER AVAILABLE SOURCES. THIS PLAN DOES NOT NECESSARILY DEPICT THE EXACT LOCATION OF ALL UTILITIES WHICH MAY EXIST AT THIS TIME WITHIN THE PREMISES SURVEYED. LOCATIONS SHOULD BE VERIFIED BY THE RESPECTIVE UTILITY COMPANY BEFORE BEING RELIED UPON. ALL FIELD CHANGES MUST BE APPROVED BY THE ENGINEER.
6. LOCATION AND INVERTS OF EXISTING UTILITIES SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO CONSTRUCTION. ALL FIELD CHANGES MUST BE APPROVED BY THE ENGINEER.
7. FUSS & O'NEILL MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA. FUSS & O'NEILL FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. FUSS & O'NEILL HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. BEFORE CONSTRUCTION, THE CONTRACTOR SHALL CALL DIG SAFE SYSTEMS FOR CLEARANCE.

REGULATORY REQUIREMENTS

1. APPROVED PLANS SHALL BE ON SITE AT ALL TIMES.
2. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.
3. WITHIN STATE RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH THE MASS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
4. THE CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
5. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
6. CALL DIG-SAFE 811 OR 1-888-DIG-SAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.

LEGEND

BOUND SET	■	UTILITY POLE	
IRON PIPE FOUND	○	LIGHT POLE	
IRON ROD FOUND	●	HYDRANT	
IRON PIPE SET	●	WATER GATE	
CATCH BASIN		GAS GATE	
DRAINAGE MANHOLE		CHAIN LINK FENCE	
SANITARY MANHOLE		SPOT GRADE	202x00
ELECTRIC MANHOLE		CONTOUR	200
MONITORING WELL			
GAS LINE			G
WATER LINE			W
OVERHEAD WIRES			OHV
BURIED CATV-TEL			T
BURIED ELECTRIC			UEL
STORM WATER DRAIN			
SANITARY SEWER			S
PROPERTY LINE			

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

COMMONWEALTH OF MASSACHUSETTS
DANIEL F. DELANY
CIVIL
NO. 45477
REGISTERED PROFESSIONAL ENGINEER
7/8/2020

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GRAPHIC SCALE

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SOUTH HADLEY LIGHT DEPARTMENT
EXISTING CONDITIONS PLAN
OLD LYMAN ROAD
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
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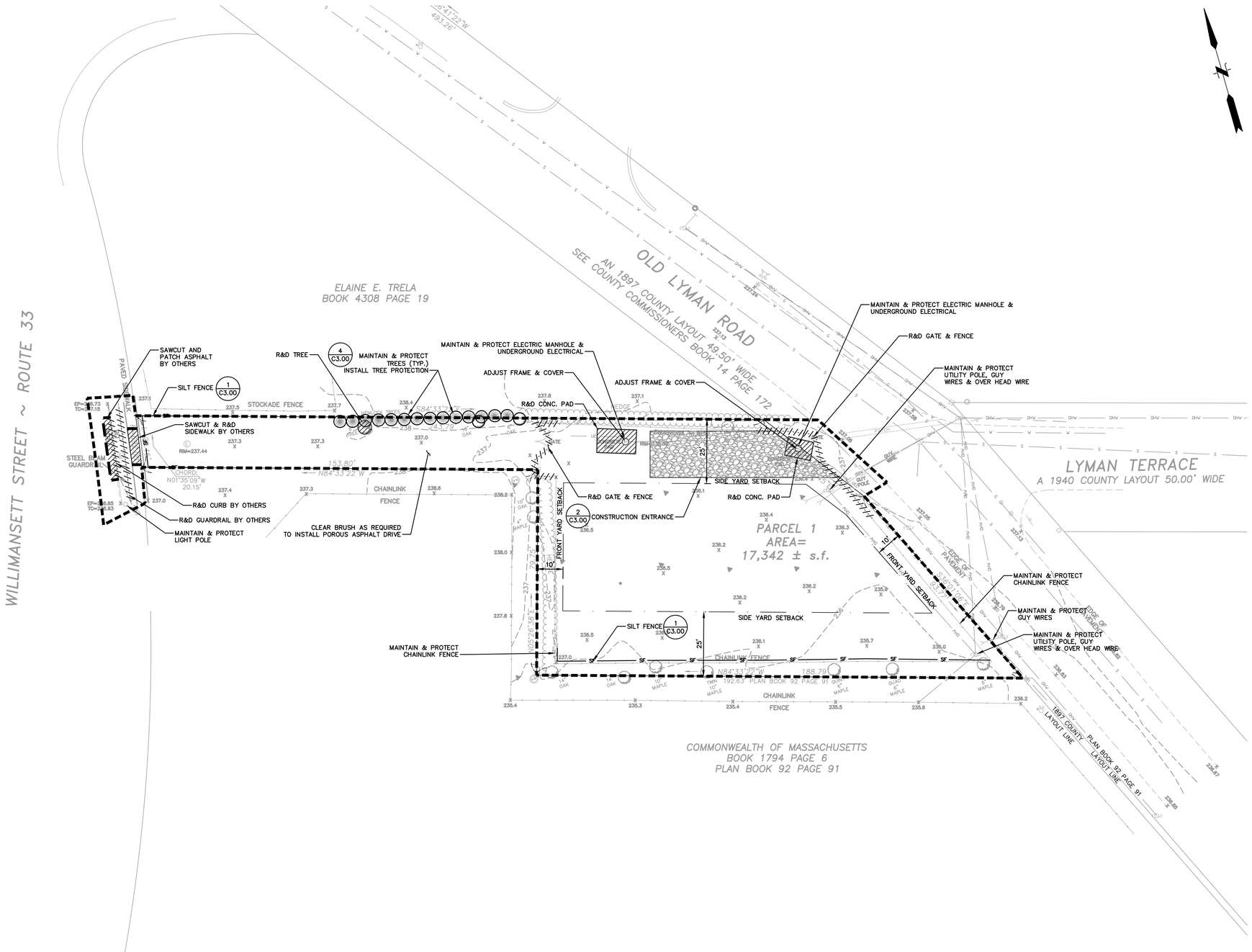

EARTHWORK

1. CALL DIG–SAFE 811 OR 1–888–DIG–SAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.
3. CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS, AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
4. REFER TO EROSION AND SEDIMENTATION CONTROL DETAILS FOR EROSION AND SEDIMENTATION CONTROL NOTES.
5. CATCH BASINS WITHIN THE WORK AREA OR DOWN STREAM OF DRAINAGE FLOW SHALL BE PROTECTED WITH CATCH BASIN SILT SACKS.
6. WATER AND CALCIUM CHLORIDE MUST BE AVAILABLE AT ALL TIMES FOR DUST CONTROL.

DEMOLITION

1. THE DEMOLITION PLAN IS PROVIDED FOR INFORMATION ONLY AND MAY NOT INDICATE ALL ITEMS REQUIRED TO BE DEMOLISHED. PERFORM A PRE–BID SITE INSPECTION. COORDINATE DEMOLITION OF UNIDENTIFIED UTILITIES OR STRUCTURES WITH OWNER. DEMOLISH STRUCTURES, SITE IMPROVEMENTS, UTILITIES, ETC. AS REQUIRED TO CONSTRUCT PROPOSED FACILITY AND UTILITY SERVICES.
2. TREES, BRUSH AND STUMPS REMOVED BY CLEARING & GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
2. WORK IS RESTRICTED TO THE HOURS OF 7AM TO 5PM, MONDAY THROUGH FRIDAY.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- ZONING SETBACKS
- SF — SILT FENCE
- R&D FENCE
- SAWCUT PAVEMENT
- R&D CONC. PAD & ASPHALT
- CONSTRUCTION ENTRANCE
- TREE PROTECTION
- R&D TREE
- R&D — REMOVE & DISPOSE
- TYP. — TYPICAL
- CONC. — CONCRETE

BID SET

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CIVIL
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REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
7/8/2020

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SOUTH HADLEY LIGHT DEPARTMENT
SITE PREPARATION PLAN
OLD LYMAN ROAD
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
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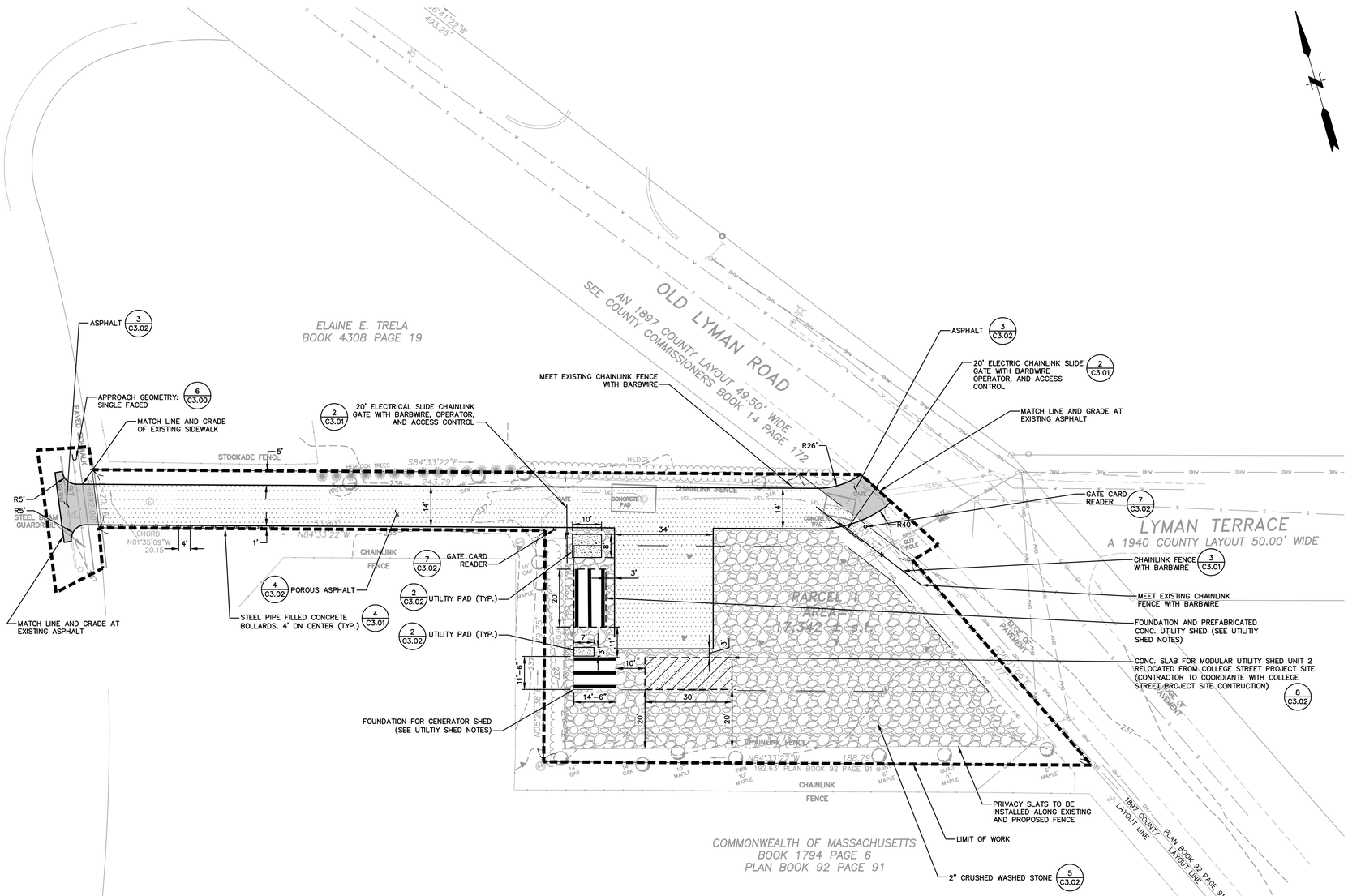

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. DIMENSIONS ARE FROM FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS NOTED OTHERWISE.
5. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.

PAVEMENT

1. CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, STONE, ETC.) UNLESS OTHERWISE NOTED. REQUIRED SEED MIX:
   - 40% CREEPING RED FESCUS
   - 40% CHEWING FESCUE
   - 10% PERENNIAL RYE
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS OUTSIDE OF THE WORK AREA TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

UTILITY SHED NOTES

1. FOUNDATION SHOWN FOR CLARITY. SUPPLIED FOUNDATION MUST MEET THE GEOMETRY AND DIMENSIONS SHOWN ON THE PLAN AND PROVIDED THE SPECIFICATIONS. CONTRACTOR MUST SUBMIT FULL SHOP DRAWINGS AND DESIGN CALCULATIONS PREPARED AND STAMPED BY THE MANUFACTURE.
2. PREFABRICATED CONCRETE SHED SHOWN FOR CLARITY. SUPPLIED SHED MUST MEET THE GEOMETRY AND DIMENSIONS AS SHOWN ON THE PLANS AND PROVIDED IN THE SPECIFICAITONS. CONTRACOTOR MUS SUBMIT FULL SHOP DRAWINGS AND DESIGN CALCULATIONS PREPARED AND STAMPED BY THE MANUFACTURE.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- ZONING SETBACKS
- PROPOSED CHAINLINK FENCE WITH BARBWIRE
- PROPOSED FOUNDATION
- PROPOSED ASPHALT
- PROPOSED 2" CRUSHED WASHED STONE
- PROPOSED PREFABRICATED UTILITY SHED
- PROPOSED PREFABRICATED UTILITY SHED
- PROPOSED POROUS ASPHALT
- BOLLARD

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

DANIEL F. DELANEY CIVIL NO. 45477 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
7/8/2020

SCALE: HORZ.: 1" = 20' VERT.: DATUM: HORZ.: VERT.: GRAPHIC SCALE 20 10 0 20

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SOUTH HADLEY LIGHT DEPARTMENT
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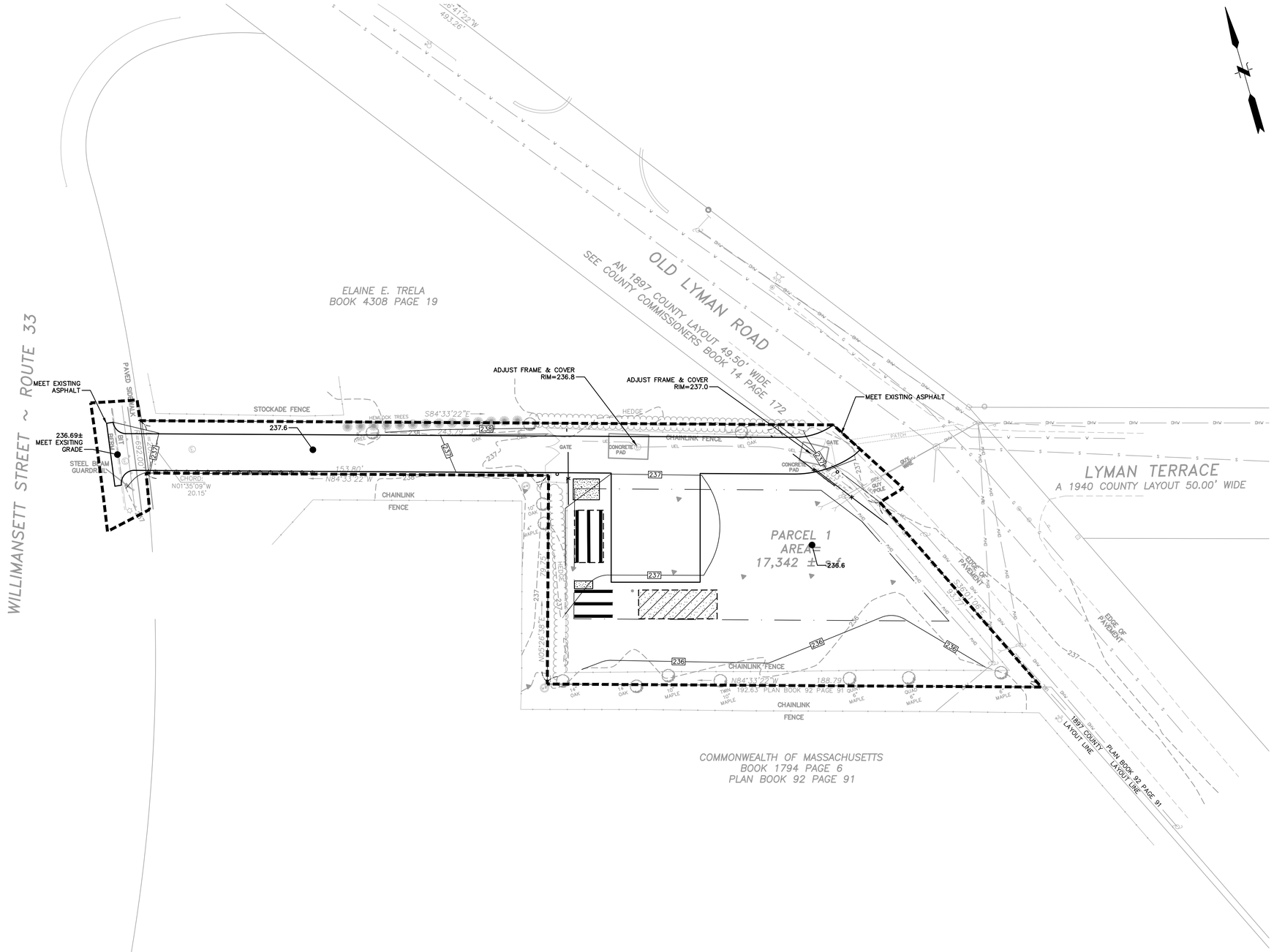

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- ZONING SETBACKS
- PROPOSED CHAINLINK FENCE WITH BARBWIRE
- PROPOSED FOUNDATION
- 236 PROPOSED CONTOURS
- 236.6 PROPOSED SPOT GRADE
- PROPOSED PREFABRICATED UTILITY SHED
- PROPOSED PREFABRICATED UTILITY SHED
- BOLLARD

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

DANIEL F. DELANY
CIVIL
NO. 45477
COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER
7/8/2020

SCALE:
HORZ.: 1" = 20'
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DATUM:
HORZ.:
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FUSS&O'NEILL
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SOUTH HADLEY LIGHT DEPARTMENT
SITE GRADING PLAN
OLD LYMAN ROAD
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
DATE: 07/01/2020

C1.30

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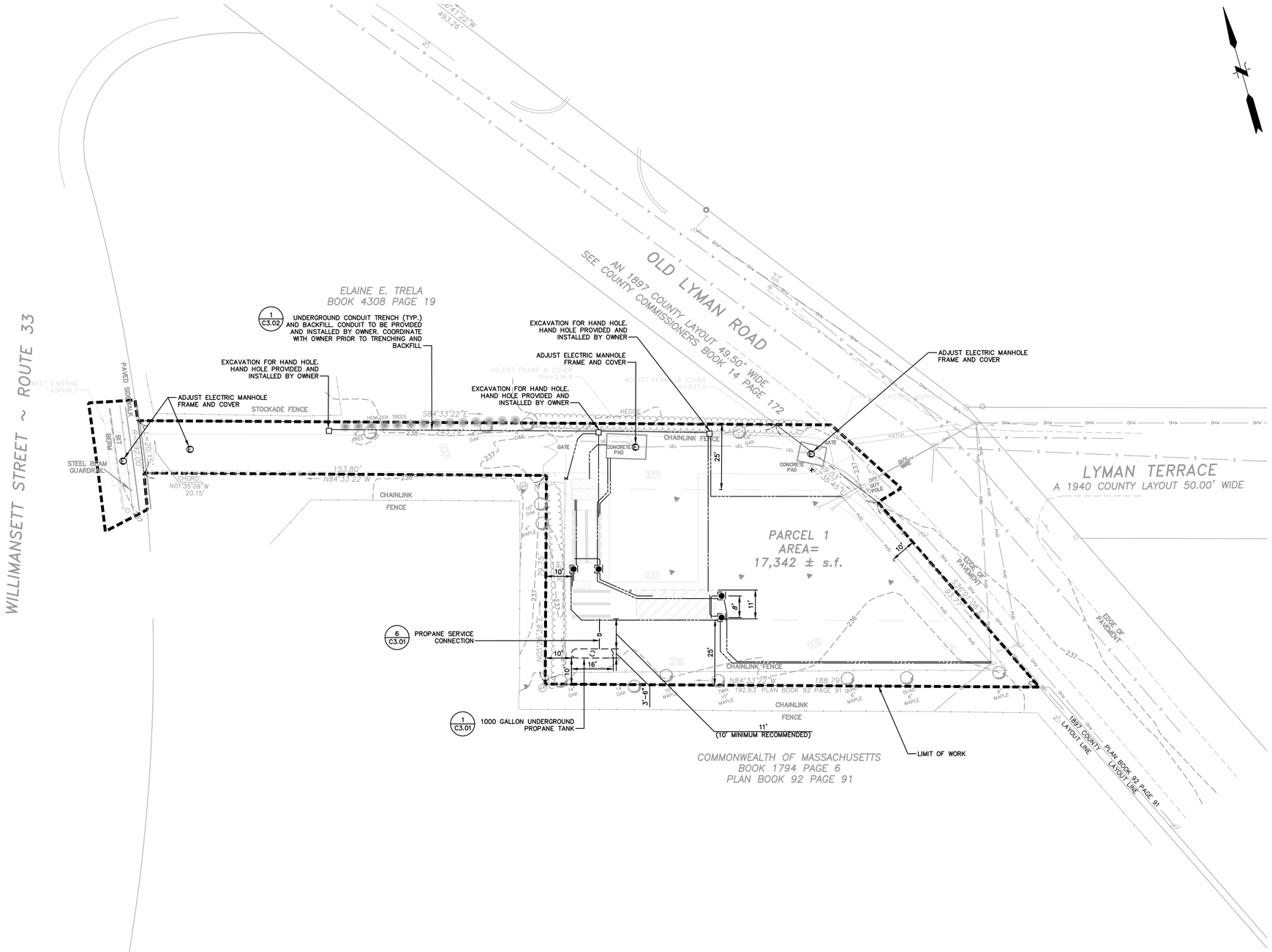

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. DIMENSIONS ARE FROM FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS NOTED OTHERWISE.
5. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND SAFETY OF TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.

ELECTRICAL AND TELECOMMUNICATION CONDUIT

1. CONCRETE AND PVC CONDUIT FOR INSTALLING ELECTRICAL AND TELECOMMUNICATIONS TRENCH WILL BE PROVIDED BY OWNER.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- ZONING SETBACKS
- PROPOSED CHAINLINK FENCE WITH BARBWIRE
- GAS SERVICE
- PROPOSED UNDERGROUND CONDUIT TRENCH
- PROPOSED PREFABRICATED UTILITY SHED AND GENERATOR FOUNDATION
- PROPOSED ASPHALT
- PROPOSED 2" CRUSHED WASHED STONE
- PROPOSED PREFABRICATED UTILITY SHED
- ELECTRICAL MANHOLE
- PROPOSED POROUS ASPHALT
- PROPOSED 1000 GALLON UNDERGROUND PROPANE TANK
- BOLLARD
- PROPOSED EXCAVATION FOR VAULT
- PROPOSED EXCAVATION FOR HAND HOLE

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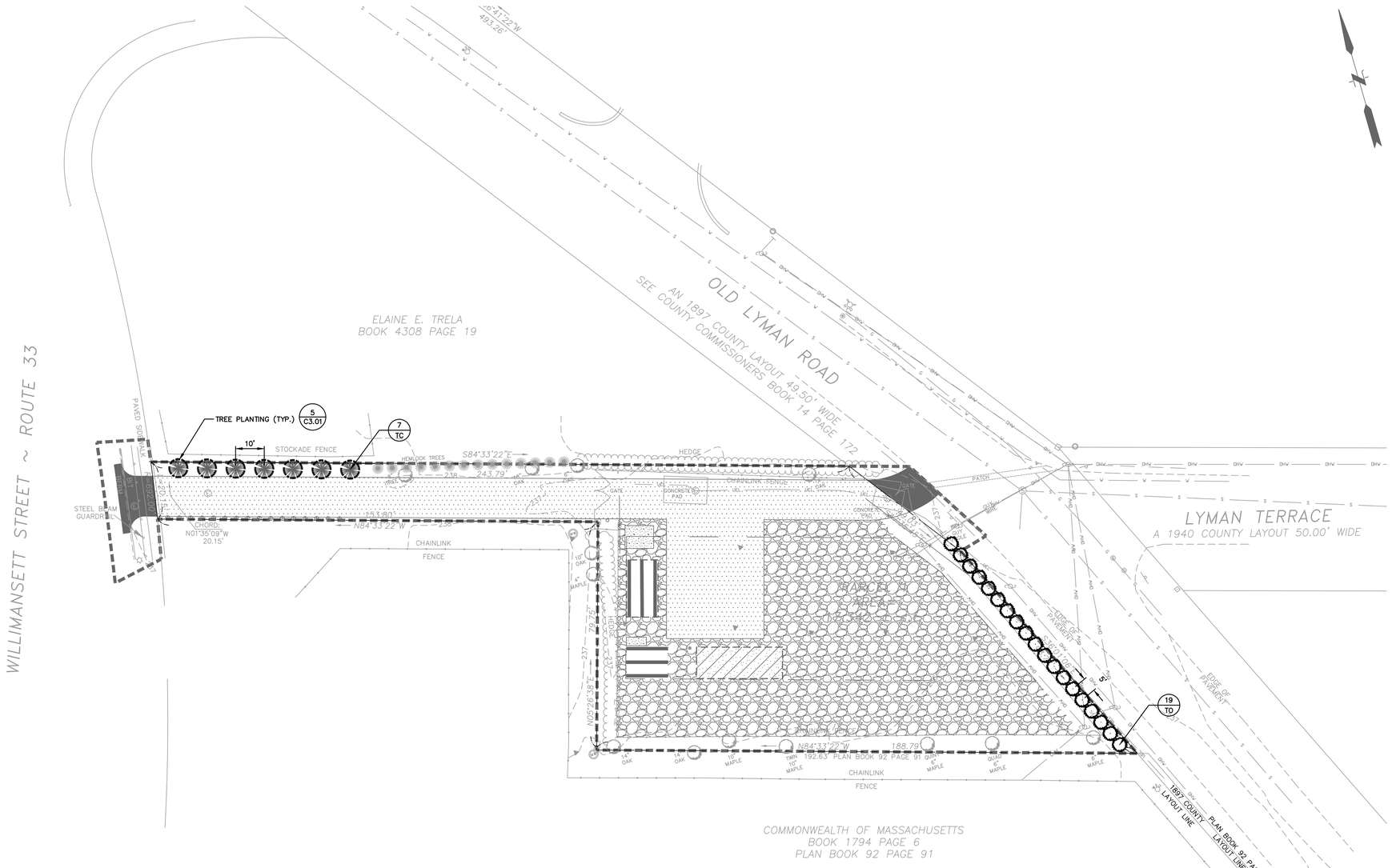

PLANTING NOTES:

1. ALL PLANTING MATERIAL TO BE NURSERY GROWN STOCK SUBJECT TO A.A.N. STANDARDS
2. THE CONTRACTOR SHALL SUPPLY ALL PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT LIST. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT LIST AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER NUMBER SHALL APPLY.
3. ALL PLANTS SHALL BE APPROVED PRIOR TO INSTALLATION AND SHALL BE LOCATED ON SITE BY THE CONTRACTOR FOR THE APPROVAL OF THE LANDSCAPE ARCHITECT. ANY INSTALLATIONS WHICH WERE NOT APPROVED BY THE LANDSCAPE ARCHITECT AND WHICH ARE SUBSEQUENTLY REQUESTED TO BE MOVED WILL BE DONE AT THE CONTRACTORS EXPENSE.
4. PRECISE LOCATION OF ITEMS NOT DIMENSIONED ON THE PLAN ARE TO BE FIELD STAKED BY THE CONTRACTOR AND SHALL BE SUBJECT TO THE REQUIREMENTS SPECIFIED IN THE PREVIOUS NOTE.
5. ALL SHRUB MASSINGS AND TREE PITS SHALL BE MULCHED TO A DEPTH OF 3" WITH MULCH.
6. TREES SHALL NOT BE STAKED UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGED VEGETATION AND SHALL REPLACE OR REPAIR ANY DAMAGED MATERIAL, AT HIS OWN EXPENSE. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AT 811 PRIOR TO CONSTRUCTION.
8. ALL SHRUB AND GROUNDCOVER PLANTING AREAS SHALL HAVE CONTINUOUS BEDS OF TOPSOIL 12" DEEP. ALL SOD AND HYDROSEED AREAS SHALL HAVE A MINIMUM TOPSOIL BED OF 6".
9. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES IN THE FIELD. WHERE PLANT MATERIAL MAY INTERFERE WITH UTILITIES, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT TO COORDINATE THEIR INSTALLATION.
10. FOR PLANTING SOIL MIX, SEE SPECIFICATIONS OR PLANTING DETAILS.
11. ALL EXISTING RILL, GULLY OR CHANNEL EROSION SHALL BE FILLED WITH APPROPRIATE BACKFILL MATERIAL, FINE RAKED, SCARIFIED AND STABILIZED WITH APPROPRIATE VEGETATIVE MATERIAL AND / OR APPROPRIATE SEDIMENTATION AND EROSION CONTROL MEASURES.
12. ADJUSTMENTS IN THE LOCATION OF THE PROPOSED PLANT MATERIAL AS A RESULT OF EXISTING VEGETATION TO REMAIN SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE REPAIR AND REPLACEMENT OF PLANT MATERIAL, AS REQUIRED, FOR THE DURATION OF THE PROJECT AND SUBSEQUENT WARRANTY PERIOD.
14. PLANTINGS INSTALLED IN THE DRY SUMMER MONTHS AND / OR LAWN SEEDED OUT OF SPRING OR FALL PERIODS, IF ALLOWED BY OWNER, WILL REQUIRE AGGRESSIVE IRRIGATION PROGRAMS AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE DIRECTED BY THE OWNER.
15. UPON COMPLETION OF PLANTING, REMOVE FROM SITE ALL EXCESS SOIL, MULCH, AND MATERIALS AND DEBRIS RESULTING FROM WORK OPERATIONS. CLEAN UP SHOULD BE COMPLETED AT THE END OF EACH WORKING DAY. RESTORE TO ORIGINAL CONDITIONS ALL DAMAGED PAVEMENTS, PLANTING AREAS, STRUCTURES AND LAWN AREAS RESULTING FROM LANDSCAPING OPERATIONS.
16. CONTRACTOR SHALL SURVEY, LOCATE, AND PROTECT ALL TREES WITHIN AREAS SHOWN AS "EXISTING VEGETATION TO REMAIN" WITHIN THE DEVELOPMENT ENVELOPE FOR REVIEW BY L.A. PRIOR TO CLEARING OPERATIONS.
17. CONTRACTOR TO RESEED ALL DISTURBED AREAS.

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
	TREES			
TO	THUJA OCCIDENTALIS 'SMARAGD'	AMERICAN ARBORVITAE	19	3' – 4' HT.
TS	TSUGA CANADENSIS	EASTERN HEMLOCK	7	3' – 4' HT.

LEGEND & STANDARD ABBREVIATIONS

- LIMIT OF WORK
- PROPERTY LINE
- ZONING SETBACKS
- PROPOSED FENCE
- PROPOSED FOUNDATION (BY OTHERS)
- PROPOSED ASPHALT
- PROPOSED GREY STONE
- PROPOSED UTILITY SHED OUTLINE
- PROPOSED TREE
- PLANT QUANTITY AND TYPE (X / XX)
- PROPOSED POROUS ASPHALT

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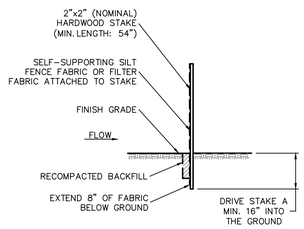
EROSION & SEDIMENT CONTROL NOTES

1. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED PRIOR TO STUMP REMOVAL AND CONSTRUCTION. STABILIZATION OF ALL REGRADED AND SOIL STOCKPILE AREAS WILL BE INITIATED AND MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
2. SEDIMENT REMOVED FROM EROSION CONTROL STRUCTURES WILL BE DISPOSED OF IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THIS PLAN. ALL STRAW BALES OR SILT FENCE RETAINING SEDIMENT OVER 6" HIGH SHALL HAVE THE SEDIMENT REMOVED AND ALL DAMAGED EROSION CONTROLS REMOVED AND REPLACED.
3. THE CONTRACTOR WILL BE ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER TOWN AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY. THE OWNER SHALL BE RESPONSIBLE FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND HAUL ROADS. CONTRACTOR SHALL CONTROL DUST TO PREVENT A HAZARD TO TRAFFIC ON ADJACENT ROADWAYS.
5. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN THIRTY (30) DAYS AFTER LAND DISTURBANCES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZE SOILS. OUTSIDE OF THE GROWING SEASON, ONLY WOOD MULCH SHALL BE USED.
6. STRAW BALES SHALL BE USED ONLY AS A TEMPORARY MEASURE. WHERE CONTROL MEASURES WILL BE REQUIRED FOR LONGER THAN SIXTY (60) DAYS, FILTER FABRIC SHALL BE USED.
7. WHERE DEWATERING IS NECESSARY, THERE SHALL NOT BE A DISCHARGE DIRECTLY INTO WETLANDS OR WATERCOURSES. PROPER METHODS AND DEVICES SHALL BE UTILIZED TO THE EXTENT PERMITTED BY LAW, SUCH AS PUMPING WATER INTO A TEMPORARY SEDIMENTATION BASIN, PROVIDING SURGE PROTECTION AT THE INLET AND THE OUTLET OF PUMPS, FLOATING THE INTAKE OF THE PUMP, OR OTHER METHODS TO MINIMIZE AND RETAIN THE SUSPENDED SOLIDS. IF A PUMPING OPERATION IS CAUSING TURBIDITY PROBLEMS, SAID OPERATION SHALL CEASE UNTIL SUCH TIME AS FEASIBLE MEANS OF CONTROLLING TURBIDITY ARE DETERMINED AND IMPLEMENTED. THE CONTRACTOR MUST SUBMIT HIS DESIGN ALONG WITH THE LOCATIONS OF THE BASIN TO THE TOWN PRIOR TO CONSTRUCTION.
8. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.

OPERATION & MAINTENANCE PLAN DURING CONSTRUCTION

AN OPERATION AND MAINTENANCE (O&M) PLAN DURING CONSTRUCTION FOR STORMWATER CONTROLS IS DESCRIBED AS FOLLOWS:

1. OWNER SHALL BE RESPONSIBLE FOR ALL OPERATION AND MAINTENANCE OF THE SITE.
2. NO EARTHWORK ACTIVITIES SHALL COMMENCE UNTIL SILT FENCE HAS BEEN INSTALLED. SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS.
3. AREAS LEFT EXPOSED TO EROSION FOR MORE THAN SEVEN DAYS SHALL BE ROUGH GRADED AND TEMPORARILY STABILIZED. AREAS DISTURBED BUT INACTIVE FOR MORE THAN THIRTY DAYS SHALL BE TEMPORARILY SEEDED.
4. EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED UNTIL SUCCESSFUL ESTABLISHMENT OF GROUND COVER.
5. NO STAGING OF MATERIALS OR LAY DOWN AREAS SHALL BE LOCATED OUTSIDE WORK LIMIT.
6. PAVED AREAS SHALL BE KEPT FREE OF SEDIMENT AND SHALL BE CLEANED PERIODICALLY AS REQUIRED BY CONSTRUCTION ACTIVITIES.
7. TEMPORARY SOIL STOCKPILES SHALL BE LOCATED WITHIN LIMIT OF WORK.
8. SEDIMENT STOCKPILES SHALL HAVE A SIDE SLOPE OF NO GREATER THAN 2:1. ALL STOCKPILES SHALL BE ROUGH GRADED OR MAINTAIN A ROUGHENED SURFACE TO PREVENT EROSION. STOCKPILES THAT ARE NOT TO BE USED WITHIN 7 DAYS SHALL BE SEEDED AFTER FORMATION OF STOCKPILE AS TO PREVENT EROSION. STRAW BALE AND SILT FENCE BARRIER SHALL BE INSTALLED AROUND STOCKPILE AREA APPROXIMATELY 10 FEET FROM TOE OF SLOPE.
9. THE CONTRACTOR IS RESPONSIBLE TO INSPECT AND REPAIR EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED TO PREVENT DAMAGE OR SEDIMENTATION.
10. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAINAGE AND SANITARY SEWER SYSTEMS.



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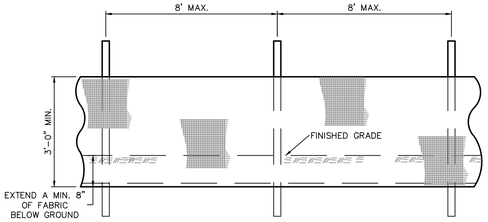

ELEVATION

SILT FENCE NOTES:

1.) INSTALL SILT FENCE & WOOD STAKES AS RECOMMENDED BY MANUFACTURER.

2.) SYNTHETIC FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE FILAMENTS AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE SPECIFICATIONS.

1 SILT FENCE
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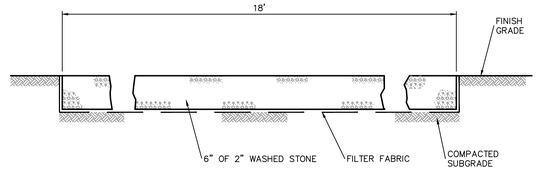

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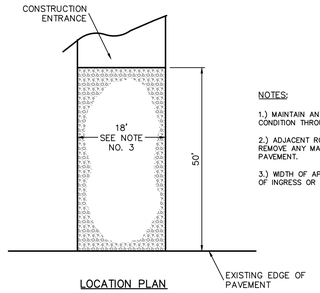


LOCATION PLAN

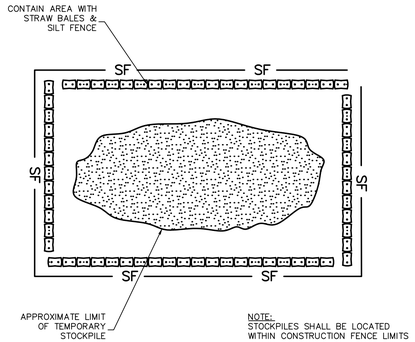
NOTES:

1.) MAINTAIN ANTI-TRACKING APRON IN GOOD CONDITION THROUGHOUT CONSTRUCTION PERIOD.

2.) ADJACENT ROADWAY SHALL BE SWEPT DAILY TO REMOVE ANY MATERIAL THAT MAY BE TRACKED ONTO PAVEMENT.

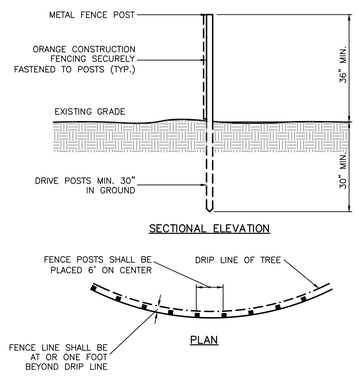
3.) WIDTH OF APRON SHALL NOT BE LESS THAN WIDTH OF INGRESS OR EGRESS.

2 CONSTRUCTION ENTRANCE
SCALE: N.T.S.



NOTE:
STOCKPILES SHALL BE LOCATED WITHIN CONSTRUCTION FENCE LIMITS

3 TEMPORARY SOIL STOCKPILE
SCALE: N.T.S.



SECTIONAL ELEVATION

PLAN

4 TREE PROTECTION FENCING
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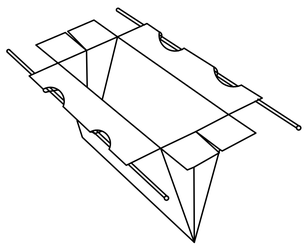

NOTES:

1. SIZED TO FIT ANY SIZE OR SHAPE CATCH BASIN.
2. ALL SEAMS DOUBLE STITCHED.
3. PERMEABILITY – REGULAR FLOW SILTSACK – 40 gal./min./sq. ft.
   HI – FLOW SILTSACK – 200 gal./min./sq. ft.

5 CATCH BASIN SILT SACK
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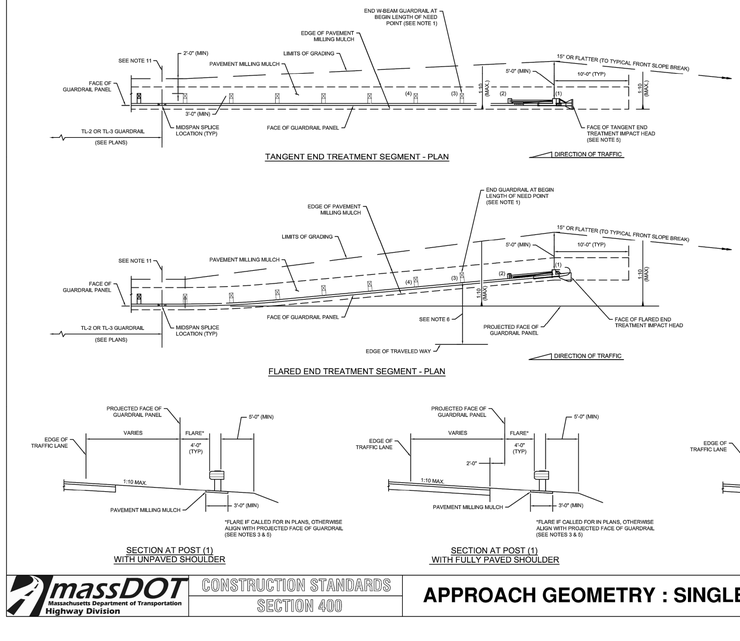

TANGENT END TREATMENT SEGMENT - PLAN

FLARED END TREATMENT SEGMENT - PLAN

NOTES:

1. INSTALL GUARDRAIL AT STATION AND OFFSET SHOWN IN THE PLANS. THE END OF THE GUARDRAIL SHOWN IN THE PLANS CORRESPONDS WITH THE BEGIN LENGTH OF NEED POINT FOR THE END TREATMENT (SHOWN AT POST 3 IN THESE STANDARDS, BUT MAY VARY BY MANUFACTURER).
2. PROPRIETARY END TREATMENTS MAY VARY IN SIZE AND SHAPE FROM WHAT IS DEPICTED IN THESE STANDARDS. HOWEVER, THE MAXIMUM SLOPES AND MINIMUM OFFSETS DIMENSIONED FROM THE POSTS SHOWN HEREIN SHALL STILL APPLY.
3. END TREATMENT TEST LEVEL AND TYPE (TANGENT OR FLARED) SHALL BE SPECIFIED IN THE PLANS.
4. CONSTRUCT TANGENT AND FLARED END TREATMENTS IN ACCORDANCE WITH THE MANUFACTURER'S UNIQUE DRAWING DETAILS, PROCEDURES, AND SPECIFICATIONS.
5. AT THE DISCRETION OF THE ENGINEER, THE FACE OF THE TANGENT END TREATMENT IMPACT HEAD MAY BE OFFSET UP TO 2'-0" FROM THE PROJECTED FACE OF GUARDRAIL TO MINIMIZE NUISANCE HITS. THE OFFSET SHALL OCCUR OVER THE ENTIRE LENGTH OF THE END TREATMENT UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER.
6. LATERAL OFFSET OF FLARED END TREATMENT SHALL BE DETERMINED BY THE DESIGN ENGINEER FOLLOWING THE METHODOLOGY FOUND IN THE ROADSIDE DESIGN GUIDE AND SHOULD FALL WITHIN THE ALLOWABLE TOLERANCES SPECIFIED BY THE MANUFACTURER. LATERAL OFFSET SHALL BE MEASURED FROM THE EDGE OF TRAVELED WAY TO THE FACE OF THE GUARDRAIL AT POST #3.
7. END TREATMENTS SHALL NOT TERMINATE CURVED W-BEAM SEGMENTS.
8. END TREATMENT IMPACT HEAD DELINEATION SHALL CONFORM TO 601.63.
9. INSTALL GRADING AS SHOWN HEREIN UNDER SEPARATE PAY ITEMS.
10. SEE 400.2.2 FOR APPROACH TERMINAL GEOMETRY FOR GUARDRAIL INSTALLED ADJACENT TO CURB AND DOUBLE FACED GUARDRAIL.
11. MAINTAIN 2'-0" (MIN) OFFSET TO FRONT SLOPE BREAK DOWNSTREAM OF MIDSPAN SPLICE LOCATION AT ALL TIMES. IF, DOWNSTREAM OF THE SPLICE, GRADING CONSTRAINTS INHIBIT THIS MINIMUM OFFSET THEN USE DEEP STEEL POSTS AND TRANSITION TO A SLOPE BREAK CONDITION DESIGN PER THE DETAIL IN 400.1.5 UNTIL THE 2'-0" OFFSET CAN BE MET.

SECTION AT POST (1) WITH UNPAVED SHOULDER

SECTION AT POST (1) WITH FULLY PAVED SHOULDER

SECTION AT POST (1) WITH TYPE 'A' BERM

MassDOT Massachusetts Department of Transportation Highway Division	CONSTRUCTION STANDARDS SECTION 400	APPROACH GEOMETRY : SINGLE FACED	DATE OF ISSUE: OCTOBER 2017	DRAWING NUMBER: 400.2.1

6
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Excavation Guidelines for Underground Propane Tanks

EASTERN Propane & Oil Since 1932

Proper excavation is the essential first step in the proper installation of an underground tank. Improper excavation can jeopardize the installation and can potentially lead to a hazardous gas leak.

Warning: *The installation of underground LP gas tanks is governed by the LP Gas Code (NFPA 58) and must always be done by a qualified professional. Installation of tanks by unqualified persons can potentially lead to a hazardous gas leak. Be sure to call Digsafe before digging: 888-DIG-SAFE (334-7233).*

Tank Size	120 Gal.	320 Gal.	500 Gal.	1000 Gal.
Tank Dimensions	5' 6" x 24" diameter	9' x 32" diameter	10' x 38" diameter	16' x 41" diameter
Weight (approx.)	252 lb.	588 lb.	921 lb.	1731 lb.
Hole Dimensions *	9' 6" L x 4' W x 44" Deep	13' L x 4' 6" W x 52" Deep	14' L x 5' W x 4' 6" Deep	20' L x 5' 6" W x 4' 6" Deep
Below the Tank-all sizes	Six inches of sand in the bottom of the hole .			
Prior to Back-filling	One 17 lb. Anode bag conntected to tank. Place at least 2' away from tank and low in the hole. Pour 1 gallon of water on bag and immediately cover with sand.			Same procedure - using 2 Anode bags.
Back-fill **	Once tank is place and inspected by the local AHJ, if required, back-fill the entire hole with sand. Grade downward and away from housing dome. This prevents water from collecting and running into or standing around the housing dome.			

* If a **concrete pad** is required, depth of hole must be 6" deeper to accommodate a 6" concrete pad in the dimensions of the tank with 4 anchor eye bolts (one in each corner of the pad). Attach stainless steel or similar strapping from lifting lugs down to eye bolts.

** Touch up any scratches or marks on tanks or lifting lugs with proper coating materials before back-filling. Be sure to keep at least half of riser (dome) above ground. Marking the halfway point before back-filling is helpful, especially *if finishing with top soil. Filling* in more than halfway can cause future water/freezing problems and must be avoided.

Gas Line Trench Specifications: The trench for buried coated copper tubing or polyethylene pipe and tubing shall be installed with a minimum 12 in. of clean fill or sand. Do not backfill until inspected by the local AHJ, if required. The minimum cover shall be increased to 18 in. if external damage to the pipe or tubing from vehicles is likely to result. Tracer wire (required for PE pipe & tubing only) along with yellow caution tape *(Caution Gas Line Buried Below)* shall be properly installed by a qualified service technician.

Tank Dome - Half of the dome must be above the ground. Grade downward and away from dome.

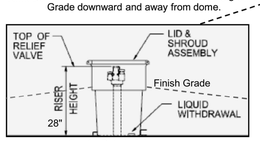
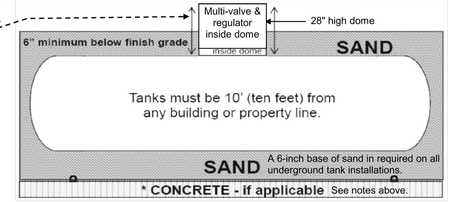
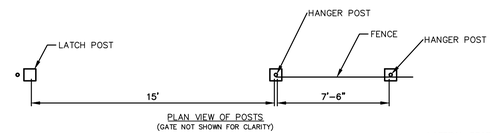


fig. A. Detail of dome



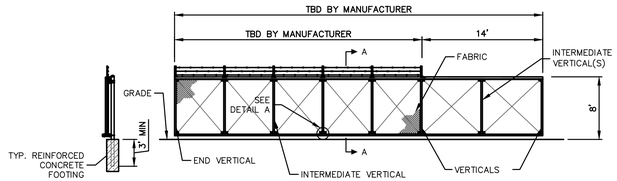
Nov. 2011 UG specs - all sizes

1 **SCALE: N.T.S.**



PLAN VIEW OF POSTS
(GATE NOT SHOWN FOR CLARITY)

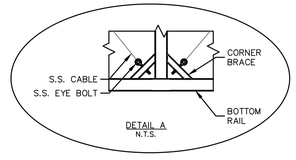
PLAN VIEW (RIGHT HAND GATE SHOWN)
(HANGERS, TRUCKS AND BOTTOM GUIDES NOT SHOWN FOR CLARITY)



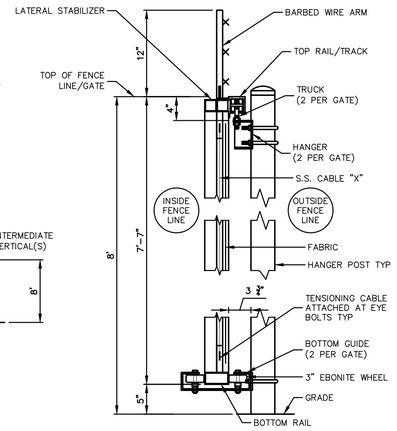
ELEVATION VIEW (RIGHT HAND GATE SHOWN)
(POSTS NOT SHOWN FOR CLARITY)

END VIEW (W/ POSTS)

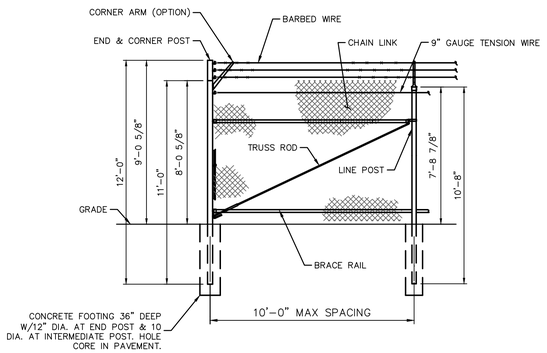
NOTE:
1. CONTRACTOR TO MATCH EXISTING FENCE HEIGHT AND STYLE.



DETAIL A
N.T.S.

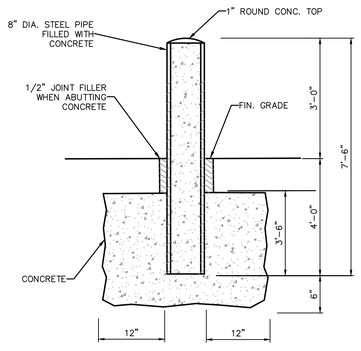


2 CHAIN LINK SLIDING GATE WITH BARBED WIRE
SCALE: N.T.S.



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. SPECIFICATIONS SHOWN CAN BE CHANGED BY THE MANUFACTURER ONLY.
3. CONTRACTOR TO MATCH EXISTING CHAIN LINK FENCE DIMENSIONS AND STYLE.

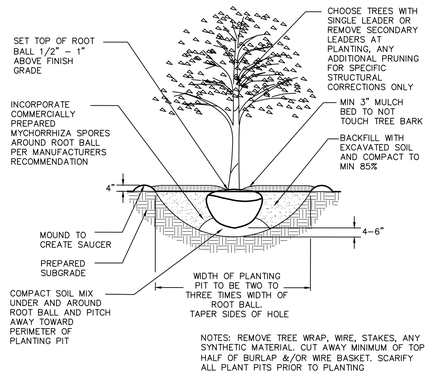
3 CHAIN LINK FENCE WITH BARBED WIRE
SCALE: N.T.S.



NOTES:
POUR CONCRETE AGAINST FIRM UNDISTURBED MATERIAL.

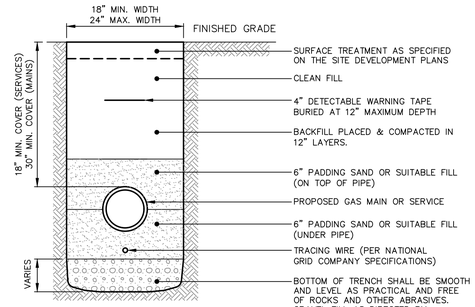
PRIME STEEL AND PAINT DARK GRAY (2 COATES)

4 STEEL PIPE FILLED CONCRETE BOLLARD
SCALE: N.T.S.



NOTES: REMOVE TREE WRAP, WIRE, STAKES, ANY SYNTHETIC MATERIAL. CUT AWAY MINIMUM OF TOP HALF OF BURLAP &/OR WIRE BASKET. SCARIFY ALL PLANT PITS PRIOR TO PLANTING

5 TREE PLANTING
SCALE: N.T.S.



NOTES:
1. ALL BEDDING MATERIAL AND INITIAL BACKFILL SHALL BE CLEAN, FREE OF DEBRIS AND RUBBLE, AND FREE OF MATERIALS WHICH MAY CAUSE POLLUTION OF GROUNDWATER.
2. SPOIL SHOULD BE SET BACK A MINIMUM OF TWO (2) FEET IN ACCORDANCE WITH OSHA REGULATIONS.
3. GAS SERVICE MUST HAVE A MINIMUM HORIZONTAL SEPARATION OF THREE (3) FEET FROM PARALLEL UTILITIES. A ONE FOOT SEPARATION MUST BE MAINTAINED WHEN CROSSING OTHER UTILITIES.
4. THE MAXIMUM TRENCH DEPTH FOR GAS MAINS IS 48–INCHES WHILE THE MAXIMUM TRENCH DEPTH FOR SERVICES IS 36–INCHES.

6 GAS TRENCH
SCALE: N.T.S.

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

DANIEL F. DELANY CIVIL NO. 45477 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
7/8/2020

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0 GRAPHIC SCALE

FUSS&O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

SOUTH HADLEY LIGHT DEPARTMENT
CONSTRUCTION DETAILS
OLD LYMAN ROAD
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
DATE: 07/01/2020

C3.01

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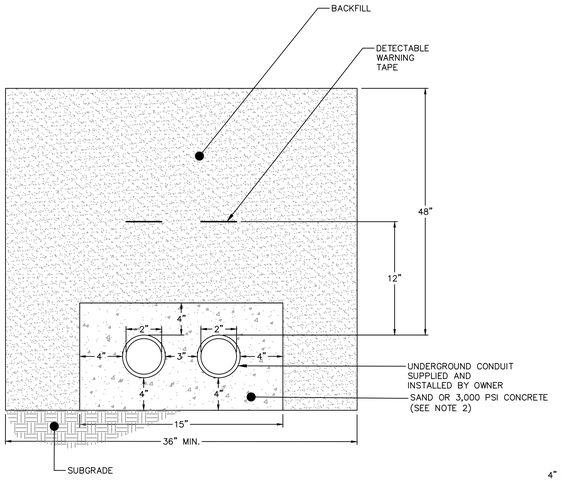
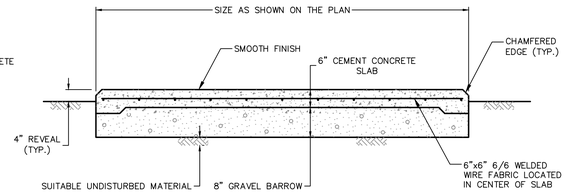


NOTES:

1. INSTALL SAND OR CR CONCRETE AND BACKFILL IN ACCORDANCE WITH SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT REGULATIONS.
2. BACKFILL WITH CONCRETE UNDER AREAS THAT WILL HAVE VEHICULAR TRAFFIC (E.G., ROADS, DRIVEWAYS, PARKING LOTS, EQUIPMENT ACCESS ROUTES, ETC.). EXTEND CONCRETE 2' PAST EDGE OF TRAVELED WAY.
3. COORDINATE WITH SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT PRIOR TO INSTALLATION.

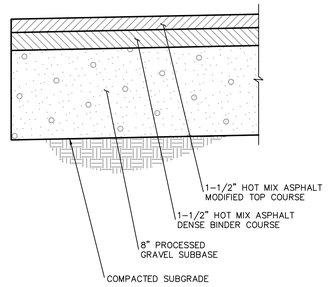
1 UNDERGROUND CONDUIT TRENCH
SCALE: N.T.S.



NOTE:

TYPICAL SLAB SECTION APPLIES TO DUMPSTER AND MISC. EQUIPMENT PADS UP TO 12'x12'

2 UTILITY PAD
SCALE: N.T.S.



3 TYPICAL PAVEMENT SECTION
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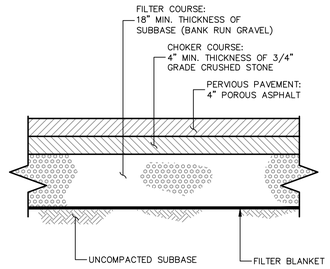
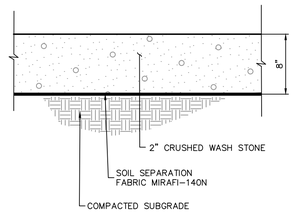


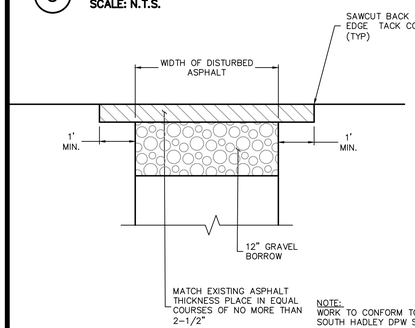
NOTE:

BOTTOM OF THE STONE IN THE RESERVOIR COURSE MUST BE COMPLETELY FLAT.

4 POROUS ASPHALT TYPICAL SECTION
SCALE: N.T.S.

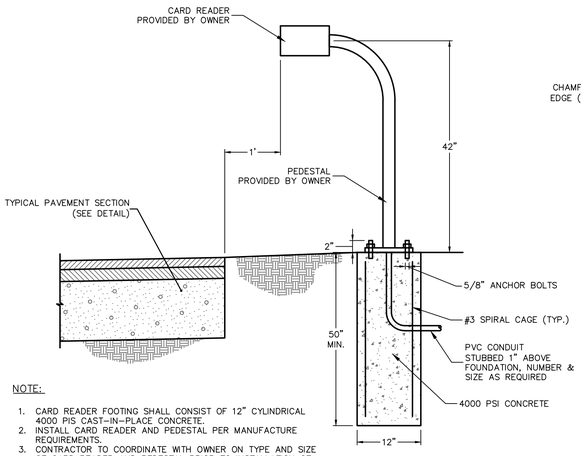


5 2" CRUSHED WASHED STONE TYPICAL SECTION
SCALE: N.T.S.



NOTE:
WORK TO CONFORM TO TOWN OF SOUTH HADLEY DPW STANDARDS

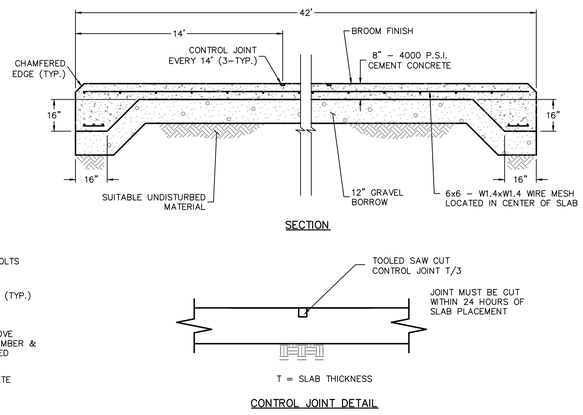
6 PATCH ASPHALT – TYPICAL DETAIL
SCALE: N.T.S.



NOTE:

1. CARD READER FOOTING SHALL CONSIST OF 12" CYLINDRICAL 4000 PIS CAST-IN-PLACE CONCRETE.
2. INSTALL CARD READER AND PEDESTAL PER MANUFACTURE REQUIREMENTS.
3. CONTRACTOR TO COORDINATE WITH OWNER ON TYPE AND SIZE OF CARD READER AND PEDESTAL PRIOR TO INSTALLATION OF FOOTING. SIZE OF FOOTING TO BE ADJUSTED AS REQUIRED.
4. CONTRACTOR TO COORDINATE PVC CONDUIT NUMBER, SIZE, AND LOCATION WITH OWNER.

7 GATE CARD READER
SCALE: N.T.S.



SECTION

CONTROL JOINT DETAIL

8 CONCRETE PAD
SCALE: N.T.S.

EXTERIOR CONCRETE NOTES:

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE MASSACHUSETTS STATE BUILDING CODE 8TH EDITION AND ALL LOCAL REQUIREMENTS.
2. DIMENSIONS AND CONDITIONS SHALL BE VERIFIED IN FIELD PRIOR TO THE COMMENCEMENT OF WORK.
3. ALL CONCRETE SHALL HAVE A DESIGN STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED.
4. REINFORCING RODS SHALL BE ASTM A615, GRADE 60 EXCEPT WHERE FIELD BENDING IS REQUIRED, GRADE 40.
5. WELDED WIRE MESH SHALL BE ASTM A185. ALL WELDED WIRE MESH SHALL BE IN SHEET FORM.
6. PROVIDE SAW CUT EXPANSION/CONTROL JOINTS AT AREAS NOTED. ALL SAW CUT EXPANSION JOINTS SHALL BE A MINIMUM OF 1/4 OF THE SLAB THICKNESS AND A MAXIMUM OF 1/3 OF THE SLAB THICKNESS. JOINTS MUST BE CUT WITHIN 24 HOURS OF CONCRETE PLACEMENT.
7. JOINTS MUST BE SPACED IN ACCORDANCE WITH ACI-318 AND THE FOLLOWING RECOMMENDATIONS:
   4" THICK SLAB-15'X15' < 250 SQ FT
   5" THICK SLAB-18'X18' < 325 SQ FT
   6" THICK SLAB-20'X20' < 400 SQ FT
   8" THICK SLAB-25'X25' < 500 SQ FT
8. ALL CONCRETE SHALL BE MIXED AND PLACED IN ACCORDANCE WITH THE ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI-318-89 (R92).
9. CONCRETE CONTRACTOR SHALL INSTALL CHASES THROUGH THE FOUNDATION WALLS AS DIRECTED BY THE GENERAL CONTRACTOR.
10. EXTERIOR CONCRETE SLABS TO HAVE A LIGHT BROOM FINISH. CONCRETE SLABS TO RECEIVE (1) COAT OF CLEAR SEALER/HARDENER EXCEPT AS NOTED.
11. ALL REINFORCING BARS TO HAVE MINIMUM 2" COVERAGE.
12. ALL CONCRETE TO BE POURED WITH A MAXIMUM 4" SLUMP.
13. FLOOR SLAB REINFORCING MUST BE LOCATED AT OR ABOVE MID DEPTH OF THE FLOOR SLAB UNLESS TOP AND BOTTOM REINFORCEMENT IS SPECIFIED. SHEETS ARE TO BE USED IN ALL WELDED WIRE MESH APPLICATIONS. WELDED WIRE MESH TO BE PLACED WITH CHAIRS OR BOLSTERS ONLY.
14. POURING CONCRETE FLOORS IN A CHECKERBOARD PATTERN IS NOT APPROVED OR RECOMMENDED BY ACI.
15. SEPARATE POURS MUST HAVE SMOOTH DOWELS (WRAPPED OR GREASED). DOWEL SIZES SHALL BE AS FOLLOWS:
   4" THICK SLAB 1/2"X12" LONG 18" O.C.
   5" THICK SLAB 1/2"x12" LONG 18" O.C.
   6" THICK SLAB 3/4"x16" LONG 18" O.C.
   8" THICK SLAB 3/4"x18" LONG 18" O.C.
   BOND BREAKER COMPOUND TO BE PAINTED ON PRIOR TO POURING ADJACENT SLAB.
16. ENGINEER TO APPROVE SUBGRADES PRIOR TO SLAB INSTALLATION.
17. CONTROL JOINTS AROUND ALL SLAB PENETRATIONS SHOULD BE SAWCUT THE FULL DEPTH OF THE SLAB OR BE DONE AS A CONSTRUCTION JOINT (POURED SEPARATELY).
18. ALL JOINTS SHALL BE FILLED AND SEALED.

BID SET

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

COMMONWEALTH OF MASSACHUSETTS
DANIEL F. DELANY
CIVIL
NO. 45477
REGISTERED PROFESSIONAL ENGINEER
7/8/2020

SCALE: HORZ.: NTS VERT.:
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0 GRAPHIC SCALE

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www.fando.com

SOUTH HADLEY LIGHT DEPARTMENT
CONSTRUCTION DETAILS
OLD LYMAN ROAD
SOUTH HADLEY MASSACHUSETTS

PROJ. No.: 20190284.A10
DATE: 07/01/2020

C3.02

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LAYER STATE:
MS VIEW:

South Hadley Electric Light Department

Pre-cast Concrete Building Information – Attachment D

Bid # 2020 -1A

General Specification for College Street

Precast Concrete Monolithic Building
12'W x 32'L x 9'10"

Part 1.00 Precast Concrete Building Specifications

1.01 Description

The Mod 11620 is a prefabricated, reinforced, modular, concrete building. The building measures 12' wide, 32' long and is 9'10" in height. The concrete inside clear height is 9'0" maximum

The building is to be designed so that the floor, walls and roof are monolithic and modular at manufacture. The concrete inside clear height is 9'0" maximum.

The building is designed to be handled and off-loaded with standard pickups in the roof of the structure.

1.02 Minimum Design Loading

The building is designed to meet the following minimum loading:

A. Roof Live Load: 20 PSF
B. Floor Live Load: 100 PSF
C. Floor Dead Load: 75 PSF
D. Wall Wind Load: 150 MPH
E. Earthquake: Meets all seismic requirements

1.03 Design Certification

The building is to be professionally designed and engineered to meet zoning and code requirements for the State of Massachusetts. Signed and sealed design calculations are to be provided by a registered professional engineer stating the building system meets design load requirements for the state of Massachusetts.

The building is to be designed to meet the requirements of loading of the following:

- American National Standards (A.N.S.) "Building Code Requirement for Minimum Design Loads in Buildings and Other Structures."
- American Concrete Institute (A.C.I.-318R-99) "Building Code Requirements for Reinforced Concrete."
- Concrete Reinforcing Institute "Manual of Standard Practice."

1.04 Plant Certification

The Manufacturing Plant is to “National Precast Certified” and PCI certified. We recommend the manufacturer should be engaged in producing precast concrete buildings for a minimum of three years.

Part 2.00 MATERIALS

2.01 General

The materials furnished include the precast concrete structure, fasteners, anchors, sealants, doors, and all other parts necessary for a complete building system as shown on the drawings provided by the building manufacturer. Building to be delivered to customer supplied foundation. Crane by others.

2.02 Concrete

Steel-Reinforced (ASTM A615 Grade 60 & ASTM A185 Welded Wire Fabric), 5,000 PSI minimum, 28 Day Compressive Strength, Air-Entrained (ASTM C260).

Modular Post-Tensioning Strand

Modules are post-tensioned together at floor and roof locations using 270 KSI lo lax strand, 0.50" dia., 7 wire, tensioning stresses 5,000 min. Modules of Elasticity E 28.5 (10) greased ¾" EMT sheath (ASTM A416).

2.03 Doors and Frames

Standard door and frame include the following:

A. 18 Gauge Galvanized Steel Door
B. Cast-in 16 Gauge Door Frame fitted with ¾" Stepped Steel Threshold to insure against water infiltration
C. Three 4 ½" Door Hinges with Vandal Resistant Non-Removable Hinge Pins.
D. 6” Aluminum Rain Drip Cap
E. Mortise lockset
F. Right Hand Swing (Left Hand Swing is available)

Doors and Frames shall comply with the Steel Door Institute "Recommended Specifications for Standard Steel Door Frames" (SDI-100).

2.04 Electrical

Electrical equipment and labor shall comply with the 527 CMR Massachusetts Electrical Code and 2020 NFPA-70 National Electric Code.
Codes will comply with the 9th edition 780CMR Massachusetts State Building Code.

2.06 Floor, Roof and Walls

The building has the following:

A. 3.5" Wall Thickness
B. 5" Floor Thickness
C. 5" - 4" Roof Thickness Sloped 1" over 6’

2.07 Exterior

General - The standard exterior finish is a ½" architectural fractured fin finish with a cantilever strip type extension at the base and roof line. A wide range of aesthetically appealing natural toned colors are offered for environmental compatibility.

- Fire Resistant – The building calculates at a two hour fireproof rating without affecting the structural properties of the building.
- Bullet Resistant – The building is designed for maintenance free use and is highly vandal resistant. Bullet Resistant specification is ANSI/VL threat Levels 1 – 4 and can be increased. Bullet envelope is bullet proof to a 30-06 rifle and steel bullet at 100 feet.
- Attack Resistant – Attack Resistant specification is 2 minutes DODAA and can be increased.
- Water Resistant – The building shall be entirely assembled at the plant, sealed, waterproofed and tested for water tightness.
- Ice Resistant – The building does not require any ice shields and is fully protected from ice falling from nearby towers. The building roof will withstand a fifty pound block of ice dropping 250 feet from a tower and is capable f handling the load without damage to exterior roof.

Joints will be caulked with a Tremco Dymonic compound to maintain a permanent seal under severe weather conditions.

The Roof to be furnished with 115 Mil EPDM fully adhered to the concrete roof with perimeter termination bars (color Black)

- Ice Resistant - The building does not require any ice shields and is fully protected from ice that may fall from nearby towers. The roof will withstand a fifty pound block of ice dropping 250 feet from a tower and is capable of handling the load without damage to the building.

Future Expansion Capabilities

The building is designed for future expansion if desired by the customer. The expansion feature eliminates unnecessary cutting of the building and possible damage to existing equipment in the building. It also eliminates on site or field fabrication of a new addition with little or no loss of down time of equipment.

2.08 Installation

The building will be shipped upon drop deck equipment with air suspension to minimize the stresses applied during shipment. The building shall be provided with hooks for lifting without damage to walls or roof. The building shall be lifted from inserts cast into the roof.\

2.09 Foundation

A flat level, compacted crushed stone foundation, prepared by others, is the standard factory recommended foundation. It is constructed on 3,000 PSF (minimum) soil bearing capacity, with crushed stone final grade set a minimum of 4" - 6" above the surrounding grade to insure that water drains away from the building.

A second factory recommended foundation used frequently is a concrete grade beam design. The foundation has two concrete grade beams, prepared by others, running the full length of the building perpendicular to the 12' fixed dimension. It is constructed on 3,000 PSF soil bearing capacity. A flat level of 3/4" compacted crushed stone, 8" thick, is located between the grade beams along with a 2" thick insulation board on top of the crushed stone to give added insulation to the floor. The final grade should be set above the surrounding grade to be sure that water drains away from the building.

Other foundation designs can be provided if requested by the customer. The foundation designs are generic due to varying site and soil conditions.

Precast Building size: 12’W x 32’L x 9’10” Exterior

Exterior Finishes to be

- Fractured Fin Finish with one base coat of Masterseal 581 with two finish coats of Masterprotect HB400 (color TBD)
- Roof: 115 mil full EPDM Rubber Roof fleece back with perimeter termination bars

Interior Finish

- Walls and ceiling shall receive 2” Rigid insulation board covered with ¾” Plywood laminated with Class C FRP and required accessories
- Floors: VCT tile floor *(Classic white – standard non-static product)*

Doors and Frames

- Two (2) 18 Gauge Steel Insulated Doors
- Two (2) 16 Gauge Door Frame fitted with ¾" Stepped Steel Threshold to insure against water infiltration
- Three 4 ½" Door Hinges with Vandal Resistant Non-Removable Hinge Pins
- Norton 8501PR Hold Open Closers
- Zero Thresholds
- Weatherstripping
- Sweeps
- 6” Aluminum Drip Caps
- Mortise locksets Corbin Russwin ML2057
- Right Hand Swing (Left Hand Swing is available)

HVAC

- Two (2) Four ton HVAC units, single phase power 120/208V, with 5kw electric heater, manual damper, R410 Refrigerant, low ambient cooling controls, factory phase monitor, Supply and return grilles. No Economizer
- One (1) Lead Lag Controller

Electrical to Include:

- One (1) 400 Amp Integrated Panelboard single phase, 42 position, with ATS, MTS and Surge.
- 42 branch breakers positions (Mix of 3 pole / Singles ,22k rated
- One (1) 100 Amp LEA secondary Surge Protector single phase
- Nine (9) Interior wrap lights with switch
- Two (2) Exterior Light dark sky compliant
- Eight (8) Interior 20 Amp duplex receptacles
- One (1) Exterior 20 amp GFI Receptacle
- One (1) Smoke Detector
- Two (2) Hi/low temperature alarms
- Two (2) Door contact intrusion alarm
- One (1) Telco Board 4' x 4'
- 70' of 18" Cable Tray
- Halo Grounding
- One (1) Ground bar ¼" x 4" x 12"
- One (1) Ground Bar ¼" x 4" x 20"

Miscellaneous

- One (1) First aid Kit
- One (1) Fire extinguisher with bracket (10lb)
- One (1) Wall mounted fold up desk

Preferred Manufacturer:

United Concrete Products, Inc; Yalesville, CT
Contact: Patty Norton with question email: patty@unitedconcrete.com; phone 203-678-0591

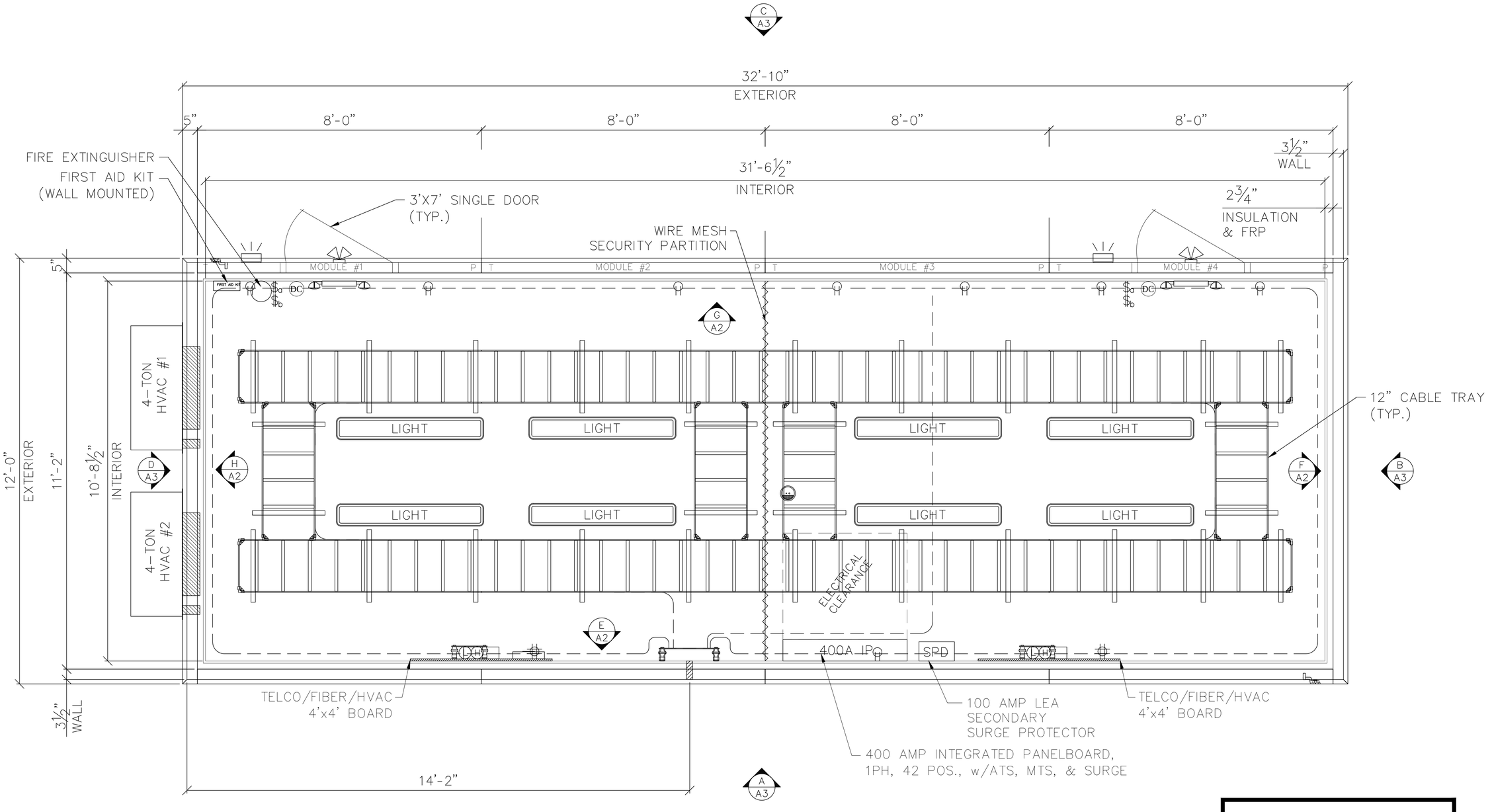
GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.



PLAN VIEW
(ROOF REMOVED FOR CLARITY)

FOR BID ONLY
NOT FOR CONSTRUCTION

DRAWING LOG		
NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	-	-

UNITED CONCRETE PRODUCTS
UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	FIBERSONIC
JOB NAME:	TELECOMMUNICATION BUILDING
JOB LOCATION:	COLLEGE STREET SITE
DWG TITLE:	MM432 - FLOOR PLAN

DRAWN BY: KMB	DATE: 2/27/20	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	QM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO: A-1	

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: **5,000 PSI @ 28 DAYS.**

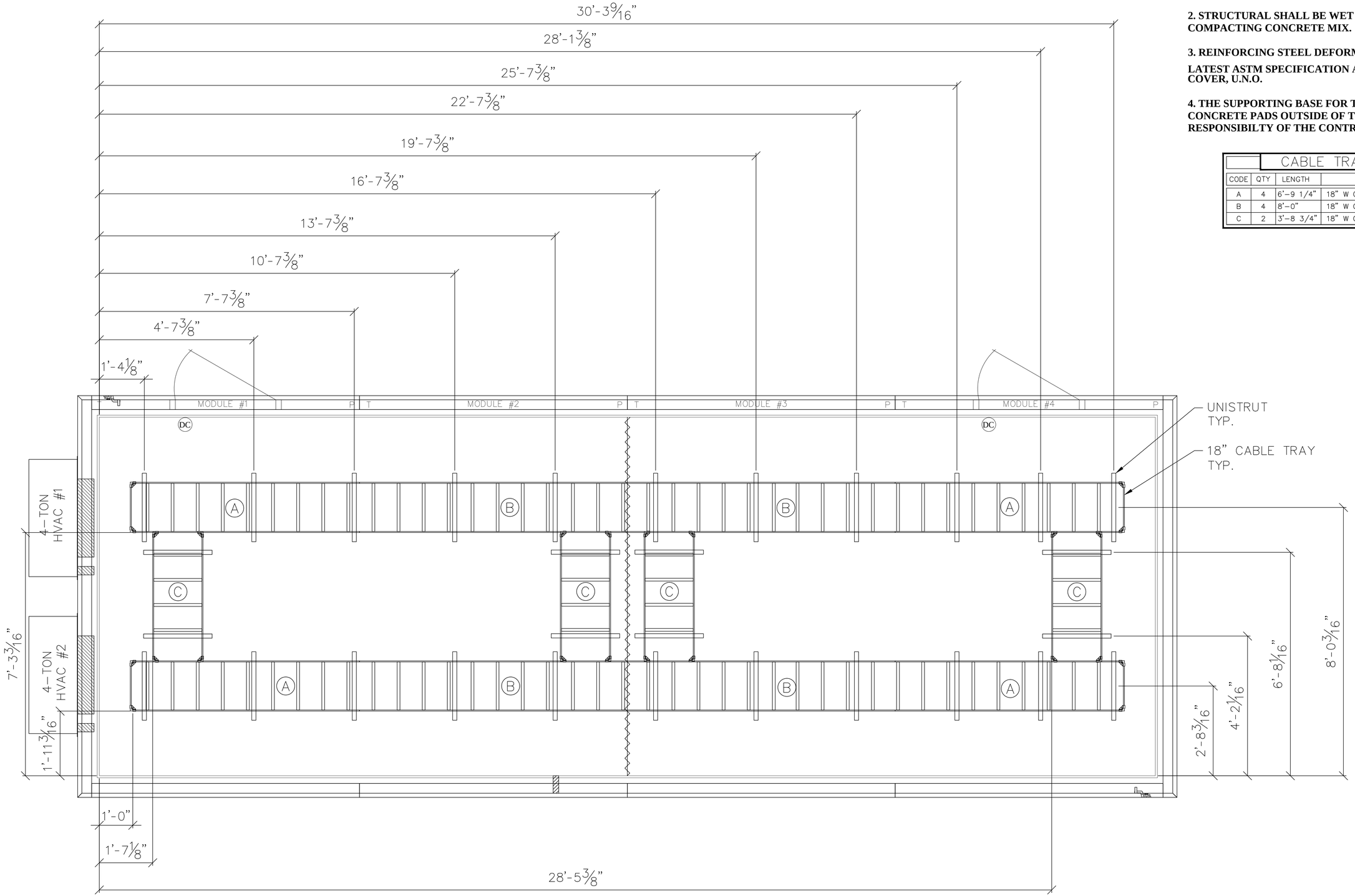
2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.

CABLE TRAY SCHEDULE

CODE	QTY	LENGTH	DESCRIPTION
A	4	6'-9 1/4"	18" W CABLE TRAY
B	4	8'-0"	18" W CABLE TRAY
C	2	3'-8 3/4"	18" W CABLE TRAY



PLAN VIEW-CABLE RACK

(ROOF REMOVED FOR CLARITY)

FOR BID ONLY
NOT FOR CONSTRUCTION

DRAWING LOG

NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	.	.

UNITED CONCRETE PRODUCTS

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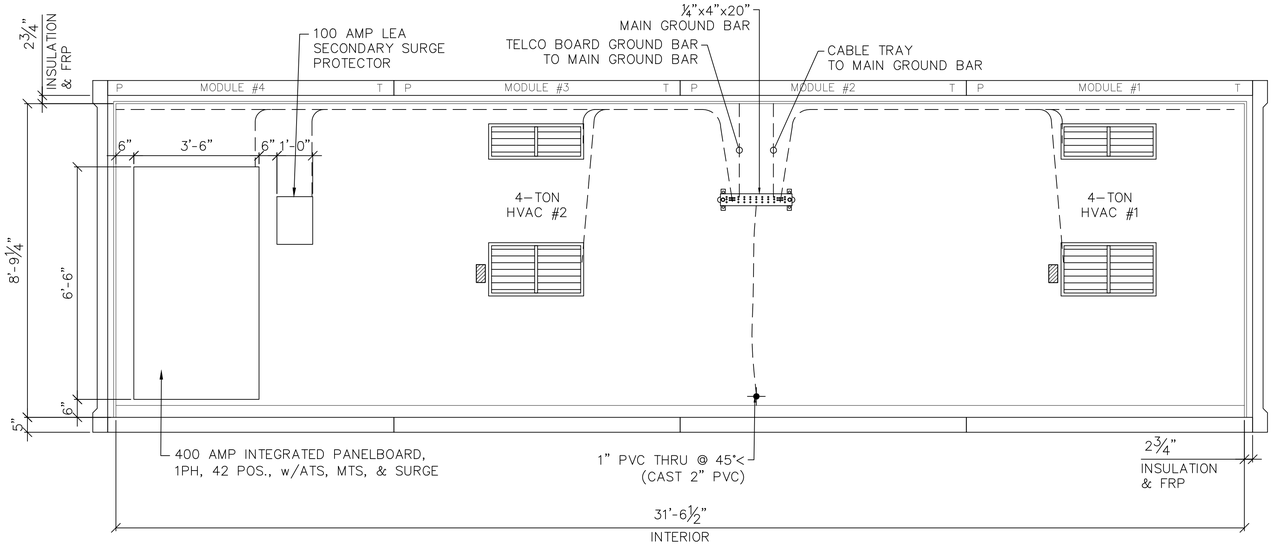
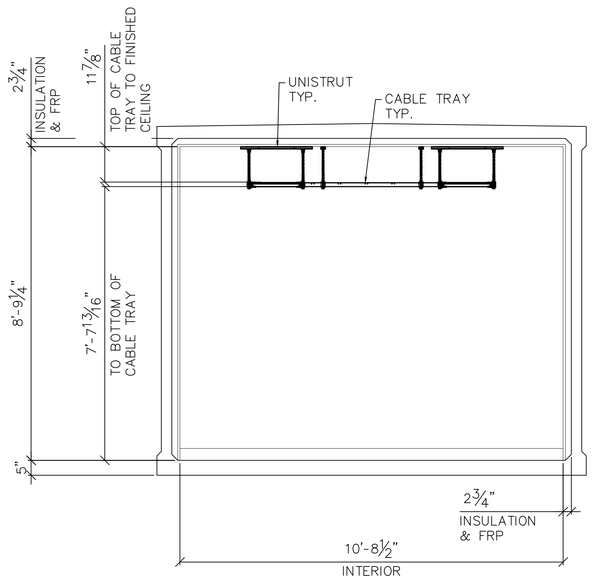
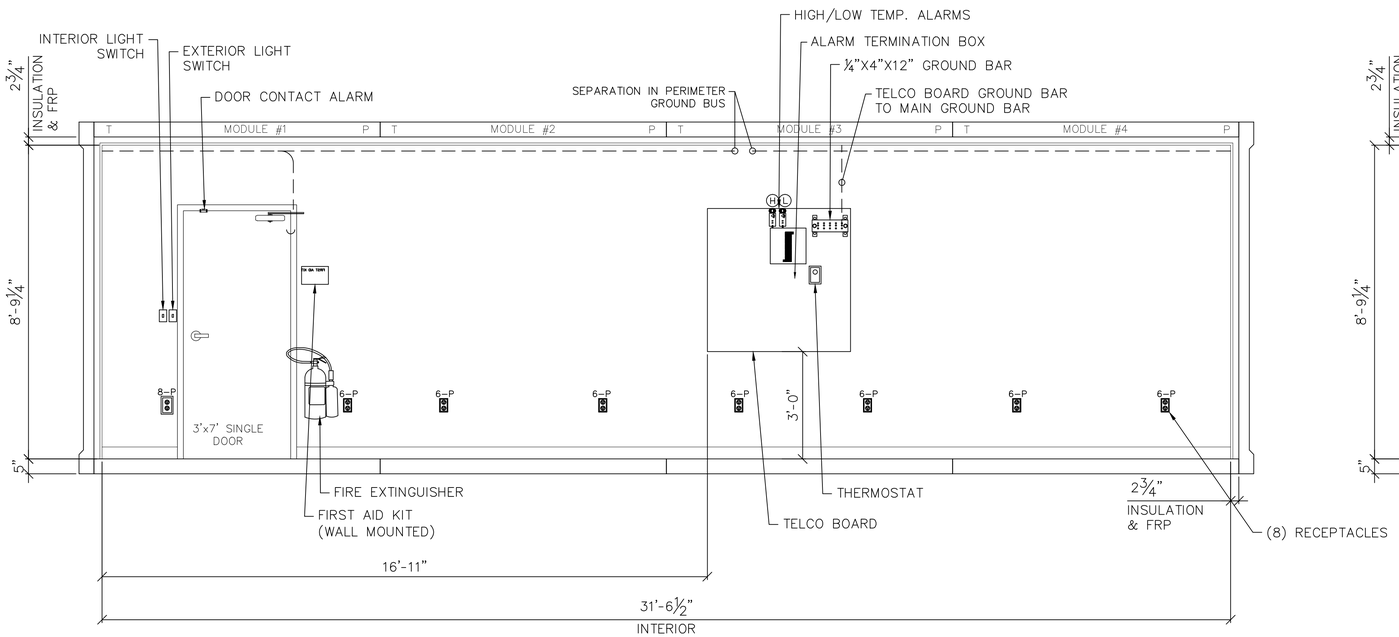
CUSTOMER:	FIBERSONIC		
JOB NAME:	TELECOMMUNICATION BUILDING		
JOB LOCATION:	COLLEGE STREET SITE		
DWG TITLE:	MM432 - FLOOR PLAN - CABLE TRAY		
DRAWN BY: JPR	DATE: 5/8/19	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	GM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO:	A-1A



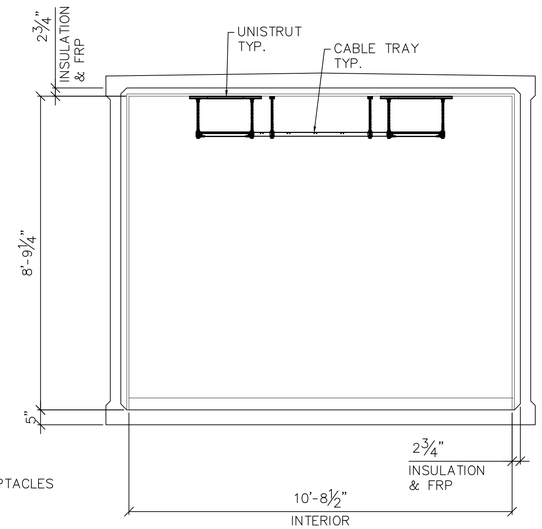
E INTERIOR ELEVATION



F INTERIOR ELEVATION



G INTERIOR ELEVATION



H INTERIOR ELEVATION

GENERAL NOTES:

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4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.

BUILDING FINISH SCHEDULE

AREA	MATERIAL/COATING TYPE	COLOR
EXTERIOR ROOF	EPDM ROOFING	BLACK
EXTERIOR WALLS	FLUTED FIN FINISH (1) COAT OF MASTERSEAL 581 & (2) COATS OF MASTERPROTECT HB400	AS SELECTED
INTERIOR WALLS & CEILING	NUDO ¾" NUFIBER FRP PANELS (ON) 2" R-MAX THERMASHEATH INSULATION BOARD (ON) 2" Z-CHANNEL FRAMING 24" O.C. WITH VINYL MOLDINGS & TRIM	WHITE
FLOORING	TILE FLOOR	CLASSIC WHITE
DOORS & FRAMES	SHERWIN WILLIAMS SHER-CRYL HPA HIGH PERFORMANCE ACRYLIC	AS SELECTED
COMMERCIAL SEALANTS	TREMCO DYMONIC FC HIGH-PERFORMACE, FAST CURING, SINGLE-COMPONENT, HYBRID SEALANT	GRAY

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DRAWING LOG

NUMBER	DATE	DESCRIPTION
4		
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CUSTOMER:	FIBERSONIC		
JOB NAME:	TELECOMMUNICATION BUILDING		
JOB LOCATION:	COLLEGE STREET SITE		
DWG TITLE:	MM432 - INTERIOR ELEVATIONS		
DRAWN BY: JPR	DATE: 5/8/19	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	GM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO: A-2	

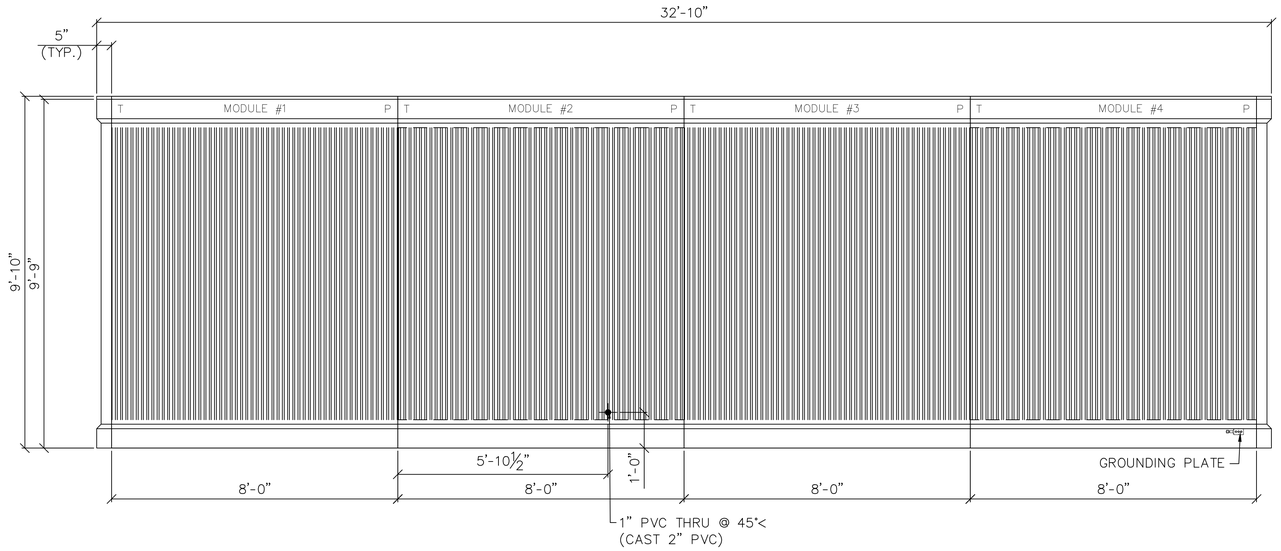
GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

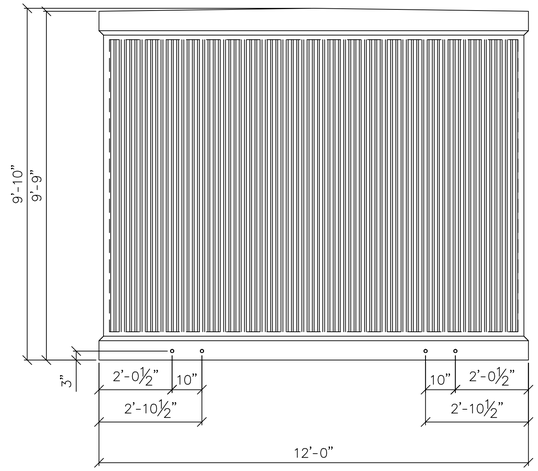
2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

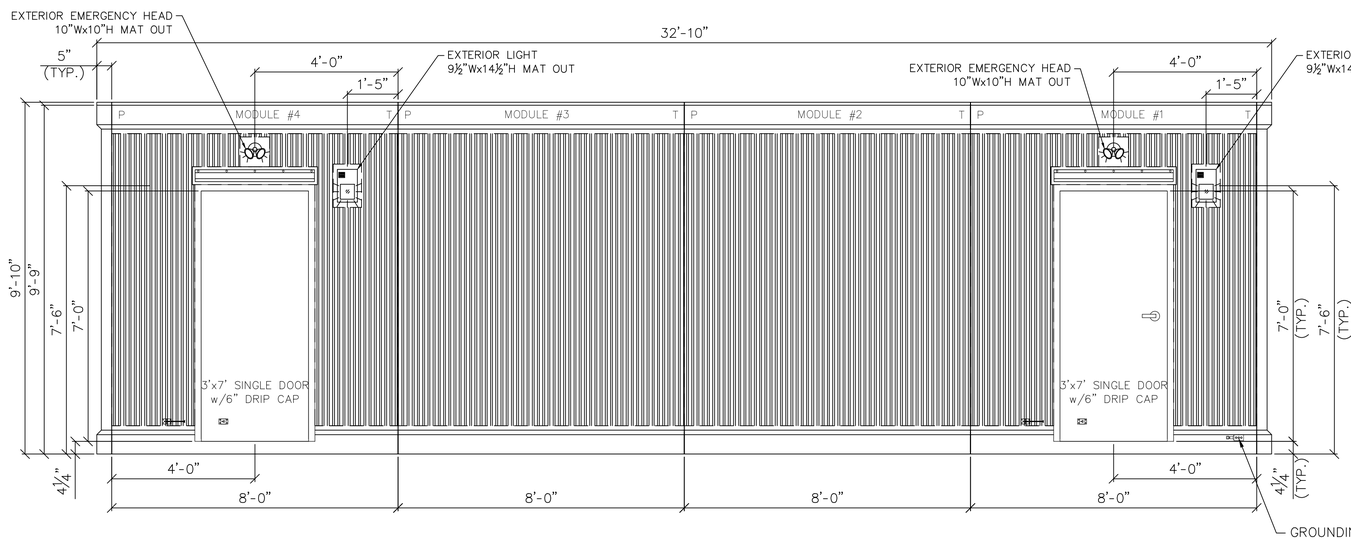
4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.



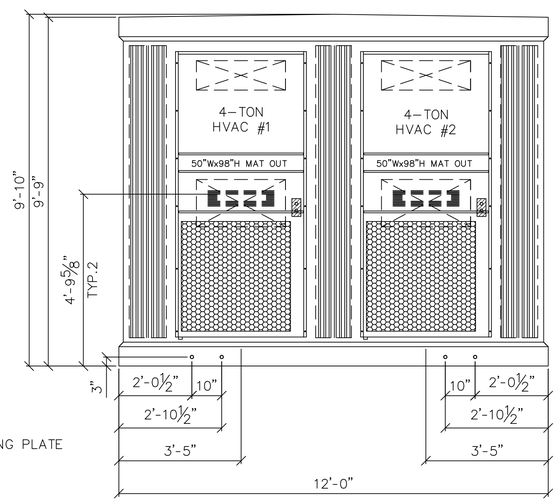
A EXTERIOR ELEVATION



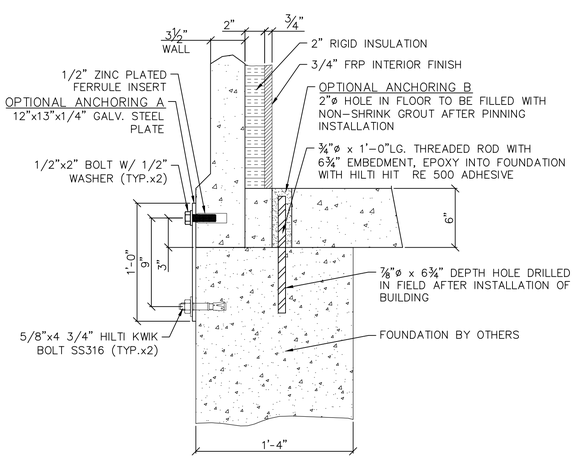
B EXTERIOR ELEVATION



C EXTERIOR ELEVATION



D EXTERIOR ELEVATION



1 SUGGESTED FOUNDATION DETAIL
GRADE BEAM FOUNDATION NTS

FOR BID ONLY
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DRAWING LOG		
NUMBER	DATE	DESCRIPTION
4		
3		
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1		

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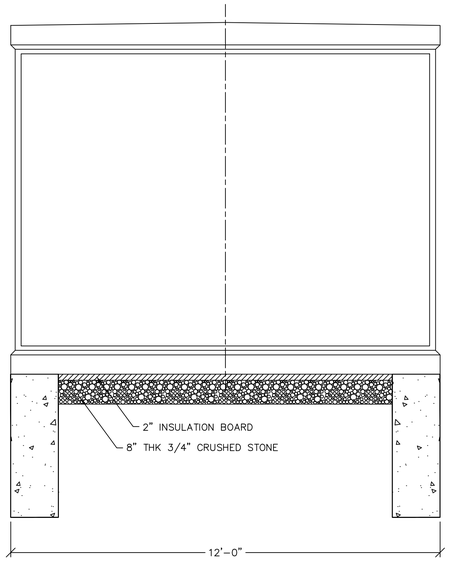
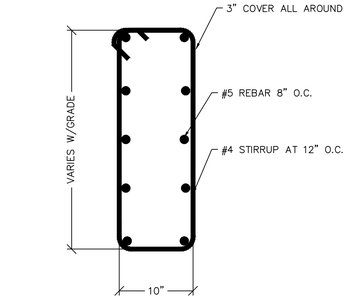
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	FIBERSONIC		
JOB NAME:	TELECOMMUNICATION BUILDING		
JOB LOCATION:	COLLEGE STREET SITE		
DWG TITLE:	MM432 - EXTERIOR ELEVATIONS		
DRAWN BY: KMB	DATE: 2/27/20	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	QM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO:	A-3

THESE FOUNDATION DRAWINGS ARE MERELY SUGGESTIONS. U.C.P. ASSUMES NO RESPONSIBILITY FOR THE FOUNDATION OF THE BUILDING. LOCAL CODE SHOULD BE FOLLOWED IN CREATING THE FOUNDATION FOR THE BUILDING.

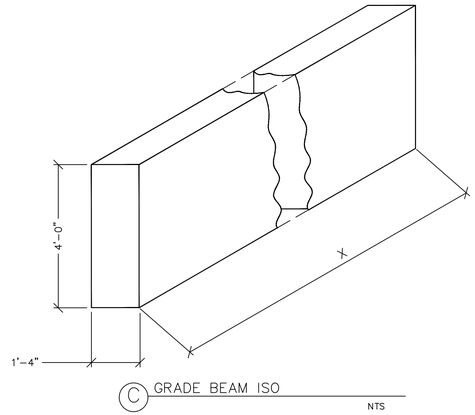


A GRADE BEAM ELEVATION
NTS

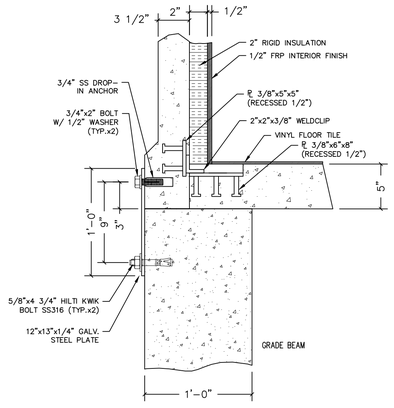


B REBAR CAGE
NTS

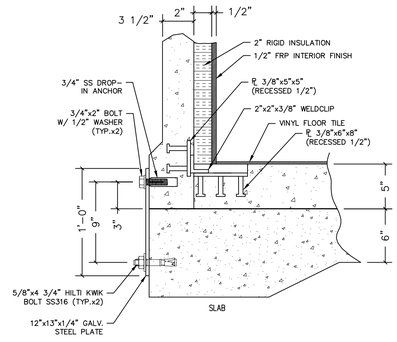
NOTES:
1. 3000 PSI SOIL BEARING CAPACITY ASSUMED.
2. ALL DIMENSIONS NOMINAL.



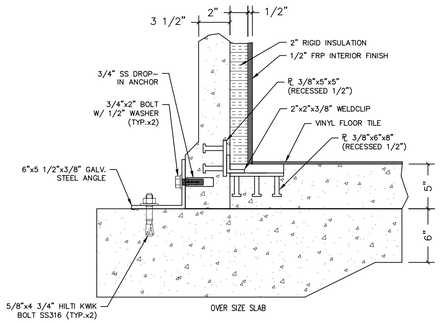
C GRADE BEAM ISO
NTS



D FLOOR TO FOUNDATION CONNECTION
NTS



E FLOOR TO SLAB CONNECTION
NTS



F FLOOR TO OVER SIZE SLAB
NTS

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DRAWING LOG

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4		
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JOB NAME:	TELECOMMUNICATION BUILDING		
JOB LOCATION:	COLLEGE STREET SITE		
DWG TITLE:	MM432 - EXTERIOR ELEVATIONS		
DRAWN BY: KMB	DATE: 7/06/20	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	GM CHK'D:	DATE:
JOB NO: 9605	SCALE: N.T.S.	DRAWING NO:	A-4

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

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3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

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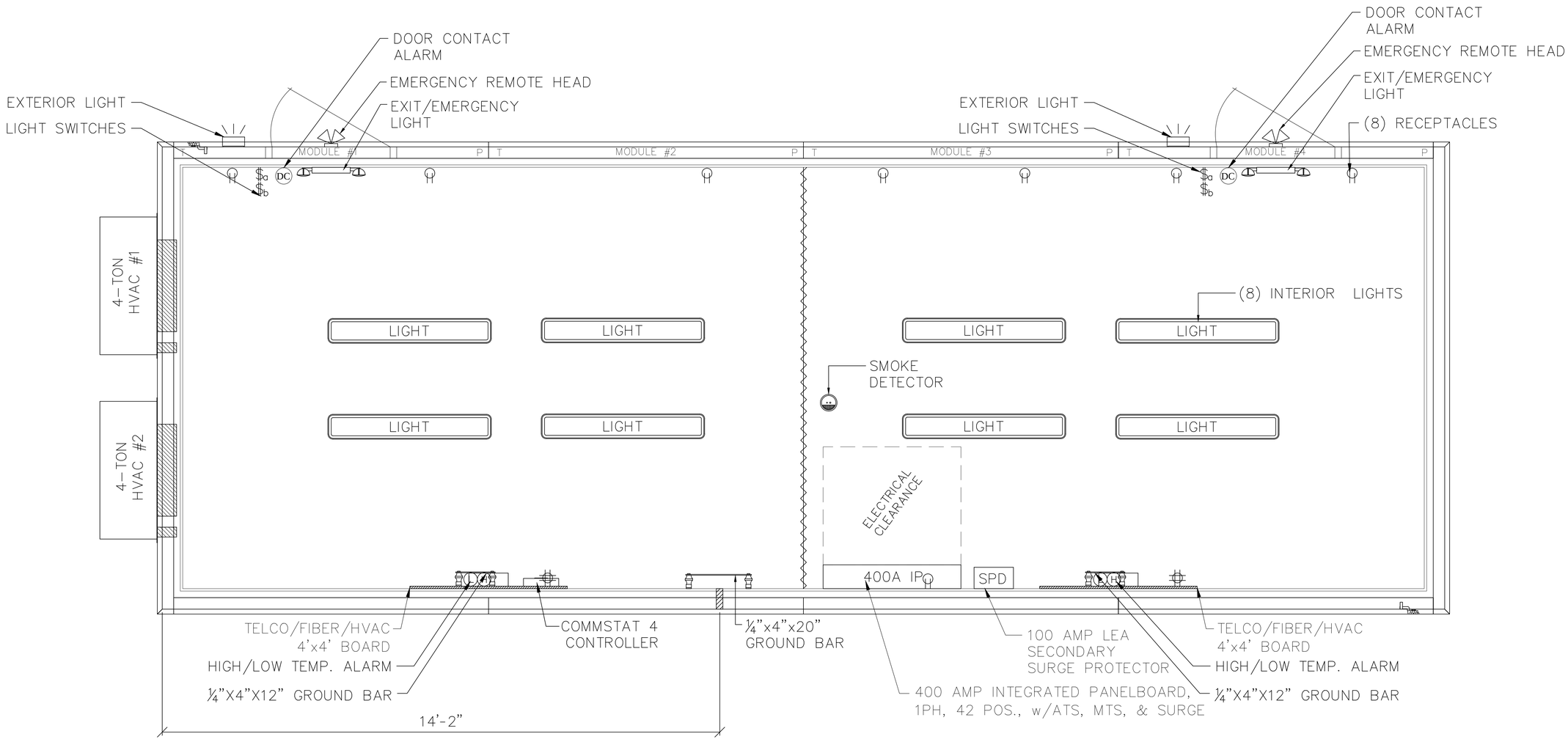

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DRAWING LOG		
NUMBER	DATE	DESCRIPTION
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CUSTOMER:	FIBERSONIC
JOB NAME:	TELECOMMUNICATION BUILDING
JOB LOCATION:	COLLEGE STREET SITE
DWG TITLE:	MM432 - FLOOR PLAN - ELECTRICAL

DRAWN BY: KMB	DATE: 2/27/20	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	QM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO:	E-1

GENERAL NOTES:

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3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

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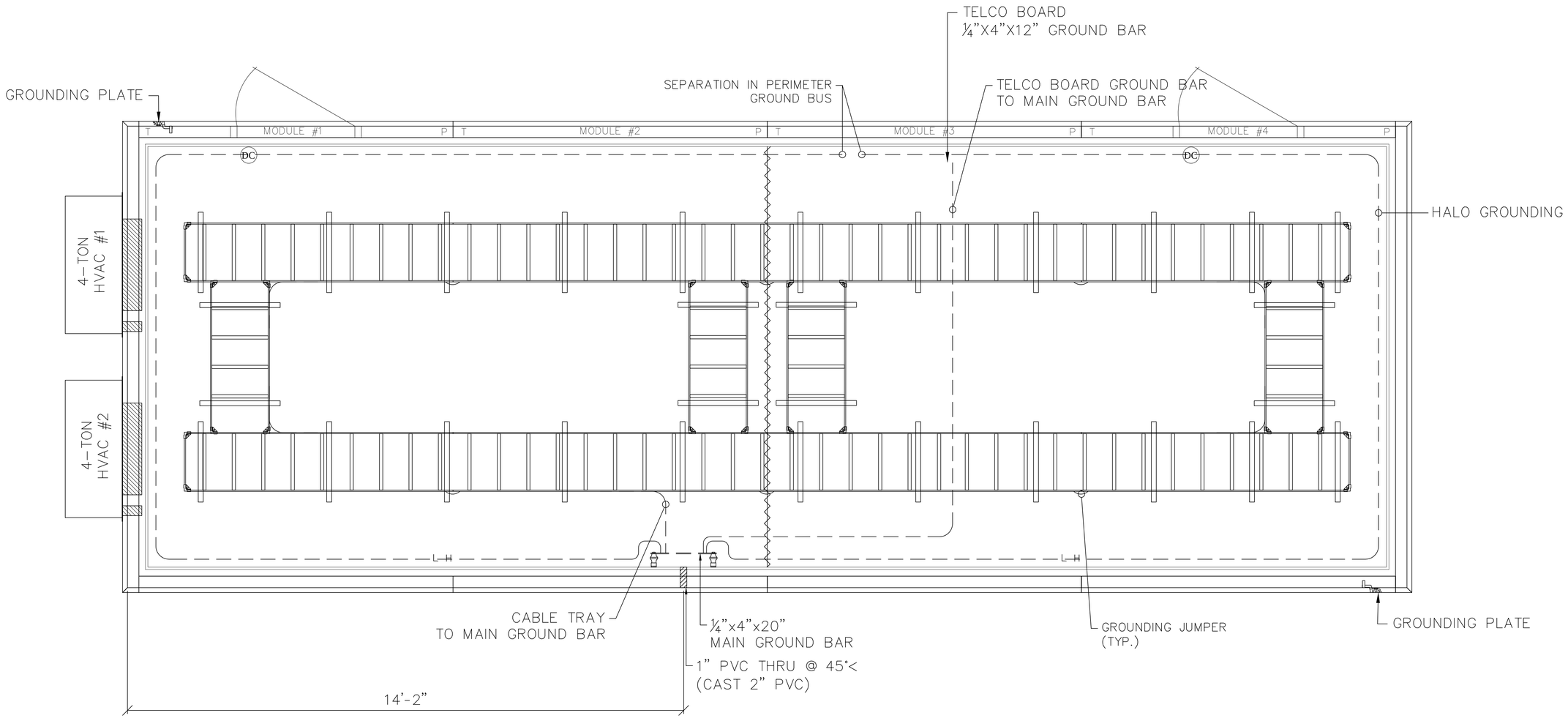

PLAN VIEW-GROUNDING

(ROOF REMOVED FOR CLARITY)

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DRAWING LOG		
NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	.	.

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CUSTOMER:	FIBERSONIC
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JOB LOCATION:	COLLEGE STREET SITE
DWG TITLE:	MM432 - FLOOR PLAN - GROUNDING

DRAWN BY: JPR	DATE: 5/8/19	PM CHK'D:	DATE:
CAD CHK'D:	DATE:	QM CHK'D:	DATE:
JOB NO: 9605	SCALE: 1/2" = 1'-0"	DRAWING NO:	E-2

General Specifications for the Old Lyman Road Site

Precast Concrete Monolithic Building
Model: Mod 11620 (11’6” width)

Part 1.00 General

1.01 Description

The Mod 11620 is a prefabricated, reinforced, modular, concrete building. The building measures 11’6” wide, 20’ long and is 9’10” in height. The concrete inside clear height is 9’0” maximum.

The Building is designed so that the walls and roof are monolithic at manufacture. The floor is connected to the walls by a secondary pour.

The building is designed to be handled and off-loaded with standard pickups in the roof of the structure.

1.02 Minimum Design Loading

The building is designed to meet the following minimum loading:

A. Roof Live Load	20PSF
B. Floor Live Load	100PSF
C. Floor Dead Load	75PSF
D. Wall Wind Load	150 PSF
E. Earthquake	Zone 4

1.03 Design Certification

The building is to be professionally designed and engineered to meet zoning and code requirements for the State of Massachusetts. Signed and sealed design calculations are to be provided by a registered professional engineer stating the building system meets design load requirements for the state of Massachusetts

The building is to be designed to meet the requirements of loading of the following:

- American National Standards (A.N.S.) "Building Code Requirement for Minimum Design Loads in Buildings and Other Structures."
- American Concrete Institute (A.C.I.-318R-99) "Building Code Requirements for Reinforced Concrete."
- Concrete Reinforcing Institute "Manual of Standard Practice."

1.04 Plant Certification

The Manufacturing Plant is to “National Precast Certified” and PCI certified. We recommend the manufacturer should be engaged in producing precast concrete buildings for a minimum of three years.

Part 2.00 Materials

2.01 General

The materials furnished include the precast concrete structure, fasteners, anchors, sealants, doors, and all other parts necessary for a complete building system as shown on the drawings provided by the building manufacturer. Building to be delivered to customer supplied foundation. Crane by others.

2.02 Concrete

Steel-Reinforced (ASTMA615 Grade 60 & ASTMA185, welded wire fabric), 5000 PSI minimum, 28 Day Compressive Strength, Air-Entrained (ASTM C260)

2.03 Doors and Frames

Standard Door and frame is the following:

A. 18 Gauge Honeycomb Core Steel Doors
B. Cast in 16 Gauge Door Frame fitted with ¾” Stepped Steel Threshold to insure against water infiltration.
C. Three 4 ½” Door Hinges with Vandal Resistant Non-Removable Hinge Pins per door
D. 6” Aluminum Drip Cap
E. Mortise Lockset (Commercial Grade)
F. Right Hand Swing (Left Hand swing is available)

Doors and Frames shall comply with the Steel Door Institute “Recommended Specifications for Standard Steel Door Frames” (SDI-100).

2.04 Electrical

Electrical equipment and labor shall comply with the 527 CMR Massachusetts Electrical Code and 2020 NFPA-70 National Electric Code.

Codes will comply with the 9th edition 780CMR Massachusetts State Building Code.

2.06 Floor, Roof and Walls

The building has the following:

A. 3 ½" Wall Thickness
B. 6" Floor Thickness
C. 4" Roof Thickness

2.07 Exterior

General – the standard exterior finish is a ½" architectural fluted fin finish with cantilever strip type extension at the roof line. The Exterior color is a natural concrete light gray or painted to customer specifications with a standard ten year masonry paint. Other finishes can be provided if specified (Check factory for options).

- Fire Resistant – The building calculates at a two hour fireproof rating without affecting the structural properties of the building.
- Bullet Resistant – The building is designed for maintenance free use and is highly vandal resistant. Bullet Resistant specification is ANSI/VL threat Levels 1 – 4 and can be increased. Bullet envelope is bullet proof to a 308 rifle and steel bullet at 25 feet.
- Attack Resistant – Attack Resistant specification is 2 minutes DODAA and can be increased.
- Water Resistant – The building shall be entirely assembled at the plant, sealed, waterproofed and tested for water tightness.
- Ice Resistant – The building does not require any ice shields and is fully protected from ice falling from nearby towers. The building roof will withstand a fifty pound block of ice dropping 250 feet from a tower and is capable f handling the load without damage to exterior roof.

2.08 Installation

The building will be shipped upon a drop deck trailer with air suspension to minimize the stresses applied during shipment. The building shall be provided with hooks for lifting without damage to walls or roof.

2.09 Foundation

A flat, level compacted crushed stone foundation, prepared by others is the standard factory recommended foundation. It is constructed on 3,000 PSF (minimum soil bearing capacity), with crushed stone final grade set minimum of 4" – 6" above the surrounding

grade to insure that water drains away from the building. Other foundation designs can be provided if requested by the customer. The foundation designs are generic due to different conditions.

Precast Concrete Building Specifications:

Exterior finishes to be

- Fractured Fin finish with one (1) coat of Masterseal 581 and two (2) finish coats of Masterprotect HB400 (color to be selected from color chart)
- Roof: One base coat of Henry Prograde Primer and one coat of Henry Prograde Roof Mastic (Standard white)

Interior finish:

- Walls and ceiling shall receive 2" Rigid insulation board covered with ¾" Plywood laminated with Class C FRP and required accessories
- VCT tile floor *(Classic white – standard non-static product)*
- One (1) First aid Kit
- One (1) Fire extinguisher with bracket (10lb)
- One (1) Wall mounted fold up desk

Door and Hardware:

- One (1) 18 Gauge Steel Insulated Door
- Cast in 16 Gauge Door Frame fitted with ¾" Stepped Steel Threshold to insure against water infiltration.
- Three 4 ½" Door Hinges with Vandal Resistant Non-Removable Hinge Pins per door
- Norton 8501PR Hold Open Door Closer
- Zero Threshold
- Weatherstripping
- Sweep
- 6" Aluminum Drip Cap
- Mortise Lockset ML2057 (Commercial Grade)

HVAC

- Two (2) 3 ton HVAC units, single phase power 120/208V, with 5kw electric heater, manual damper, R410 Refrigerant, low ambient cooling controls, factory phase monitor, Supply and return grilles. No Economizer
- One (1) Lead Lag Controller

Electrical to include:

- 200 Amp Panelboard single phase, 42 position, (bolt on breakers) 10KAIC
- Manual Transfer Switch single phase
- 100 Amp LEA Surge Protector single phase
- Meter can (Eversource Approved)
- Four (4) Interior LED 4' wrap lights with switch
- One (1) Exterior Wallpack
- Six (6) Interior 20 Amp duplex receptacles
- One (1) Exterior GFCI 20 amp Receptacle
- One (1) Smoke Detector
- One (1) High temperature Alarms
- One (1) Low Temperature Alarm
- One (1) Door contact alarm
- 40' of 18" Cable Tray
- Telco Board 4' x 4'
- Halo Grounding
- Ground bar ¼" x 4" x 12"
- Ground Bar ¼" x 4" x 20"

HVAC

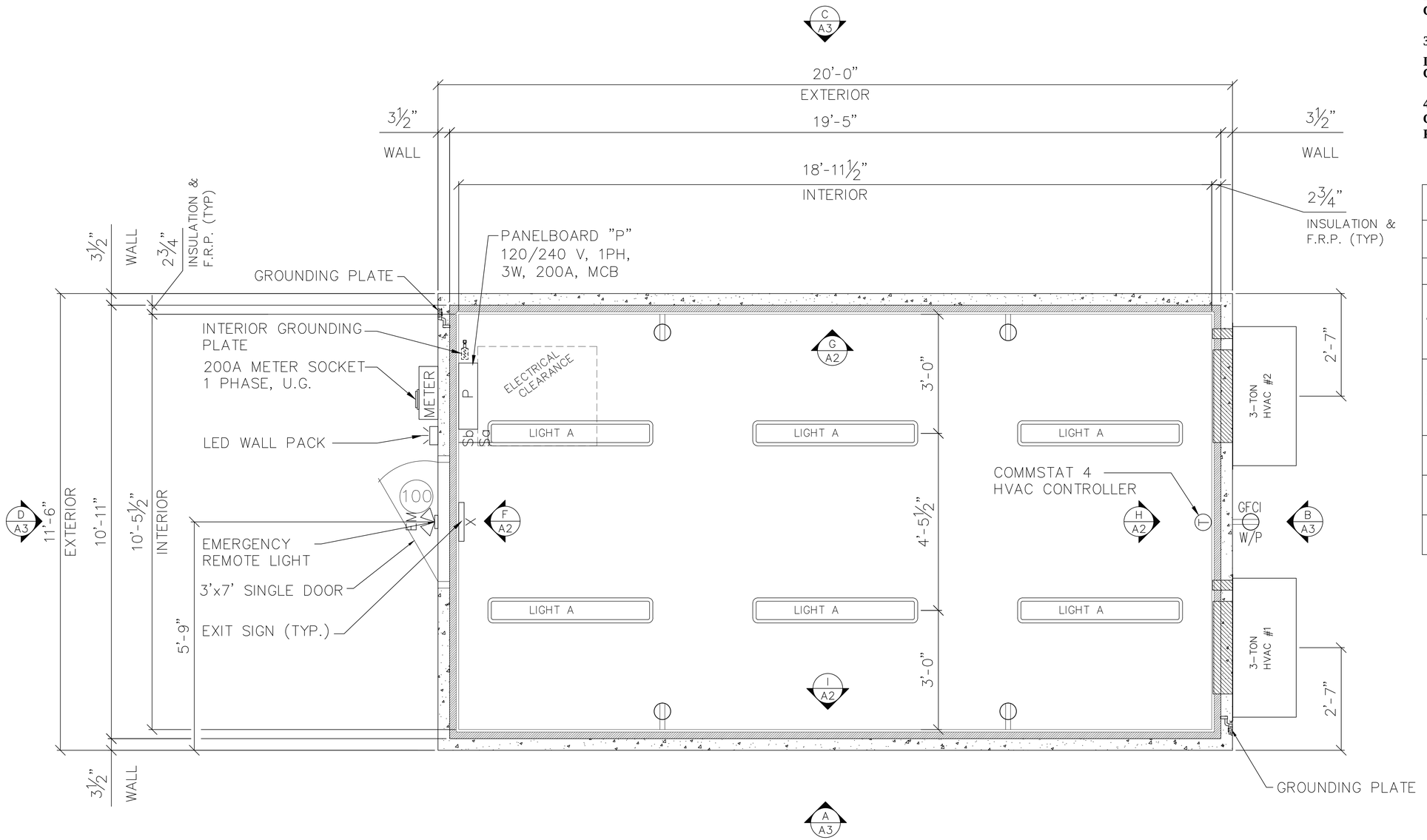
- Two (2) Marvair Two Ton HVAC units single phase 120/240V with 5kw heat, manual damper and R410 Refrigerant (Cabinet to be beige in color)
- Unit will have Telecom controls including low ambient cooling
- Factory installed phase monitor, supply and return grills, with no economizer,
- One (1) Commstat 4 Lead lag controller

Miscellaneous:

- One (1) First aid Kit
- One (1) Fire extinguisher with bracket (10lb)
- One (1) Wall mounted fold up desk

Preferred Manufacturer:

United Concrete Products, Inc. Yalesville, CT
Contact: Patty Norton, email: patty@unitedconcrete.com**;** 203-678-0591



PLAN VIEW

3/4"=1'-0"

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.

FINISH SCHEDULE

AREA	*COATING TYPE*	*COLOR*
BUILDING EXTERIOR ROOF	*(2) COATS HENRY PRO-GRADE 988 SILICONE ROOF COATING*	*WHITE*
BUILDING EXTERIOR WALLS	*(2) COATS BASF MASTERPROTECT HB400, ACRYLIC WATERPROOF COATING, FINE TEXTURE (ON) MASTERSEAL 581 WATERPROOF CEMENT-BASED COATING (ON) PRECAST FRACTURED FIN FORMLINER*	*AS SELECTED*
BUILDING INTERIOR WALLS AND CEILING	*NUDO 3/4" NUFIBER FRP (CLASS C) PLYWOOD PANELS (ON) 2" R-MAX THERMASHEATH INSULATION BOARD (ON) 2" Z-CHANNEL FRAMING 24" O.C. WITH VINYL MOLDINGS AND TRIM*	*WHITE*
FLOORING	*ARMSTRONG EXCELON VINYL COMPOSITION TILE*	*AS SELECTED*
BUILDING DOORS AND FRAMES	*(2) COATS SHERWIN WILLIAMS SHER-CRYL HPA HIGH PERFORMANCE ACRYLIC*	*AS SELECTED*
COMMERCIAL SEALANTS	*TREMCO DYMONIC FC HIGH-PERFORMANCE, FAST CURING, SINGLE-COMPONENT, HYBRID SEALANT*	*AS SELECTED*

FOR BID ONLY
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DRAWING LOG

NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	7/2/20	FOR BID ONLY, NOT FOR CONSTRUCTION

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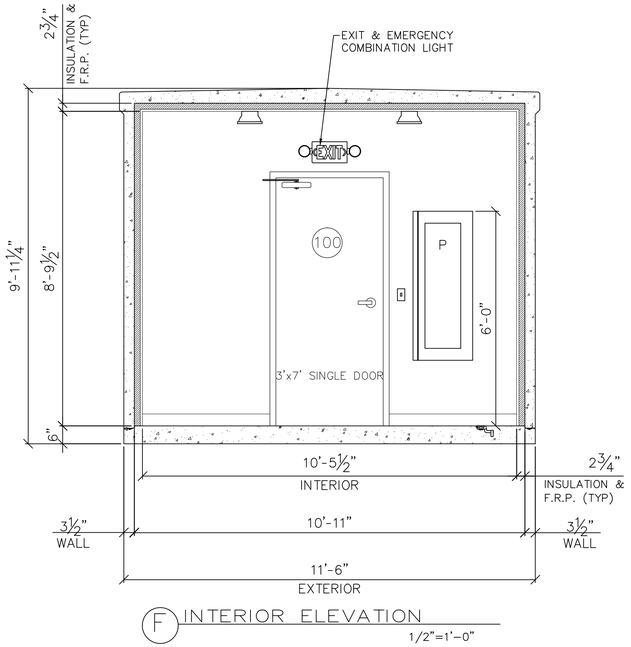
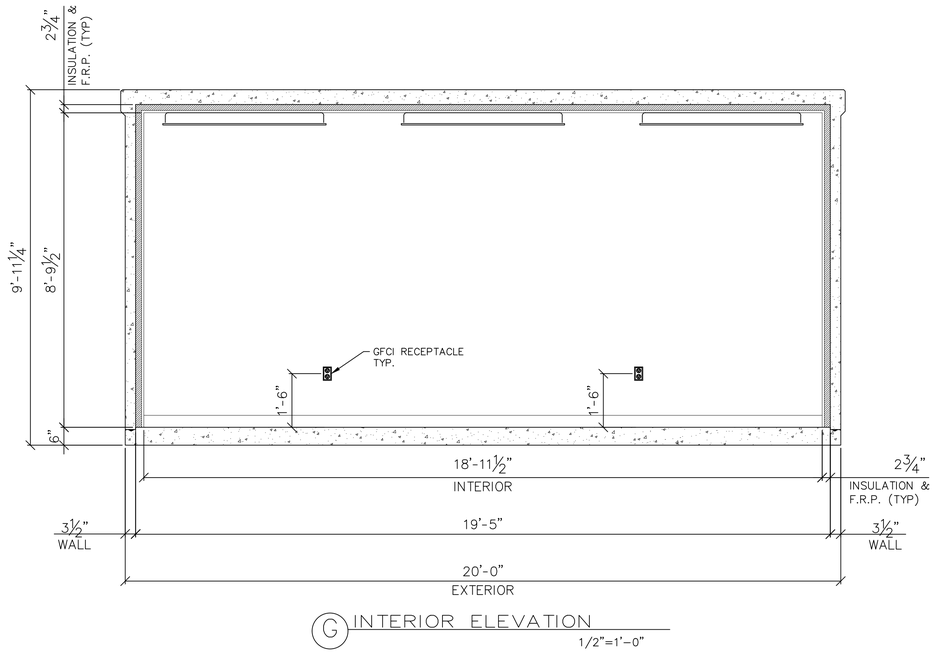
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER: FOR BID ONLY, NOT FOR CONSTRUCTION			
JOB NAME: Telecom Shelter Specification			
JOB LOCATION: Old Lyman Road			
DWG TITLE: FOR BID ONLY, NOT FOR CONSTRUCTION			
DRAWN BY: KMB	DATE: 7/02/20	PM CHK'D: PN	DATE:
CAD CHK'D:	DATE:	GM CHK'D: SK	DATE: 7/02/20
JOB NO: 9610	SCALE: 3/4" = 1'-0"	DRAWING NO: A-1	



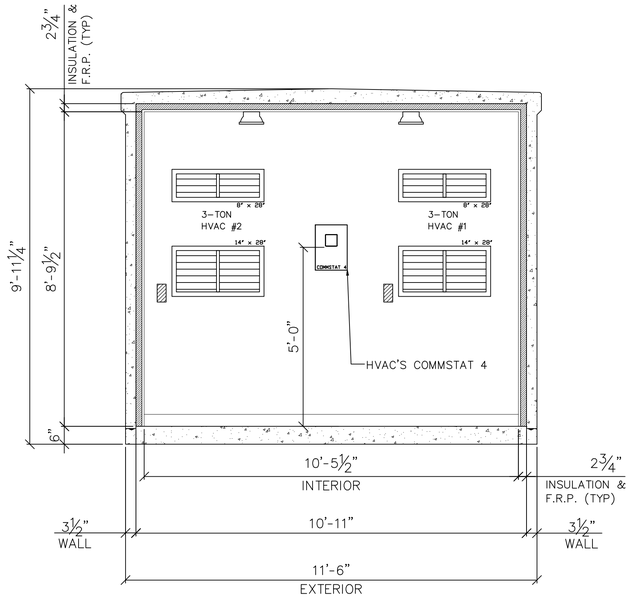
F INTERIOR ELEVATION

1/2"=1'-0"



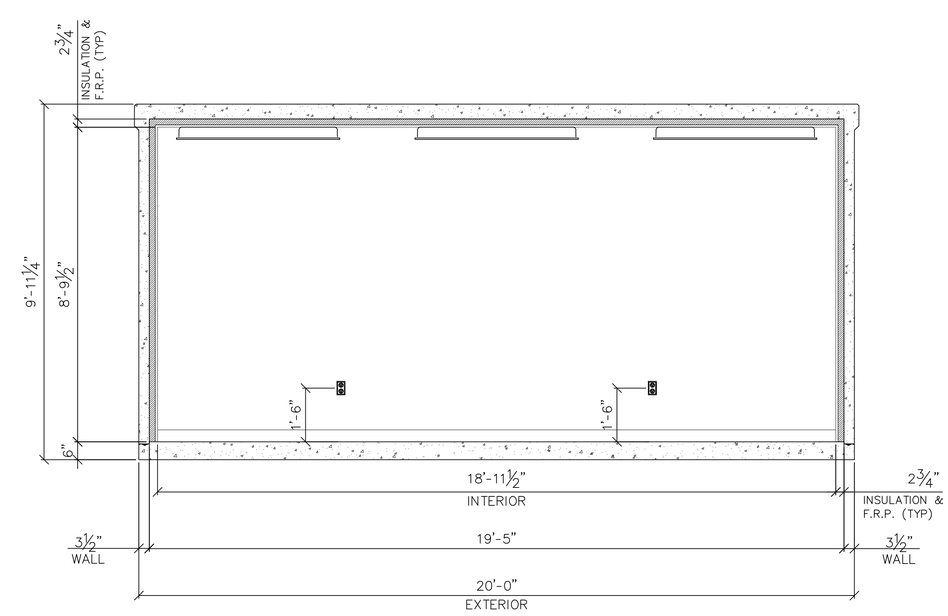
G INTERIOR ELEVATION

1/2"=1'-0"



H INTERIOR ELEVATION

1/2"=1'-0"



I INTERIOR ELEVATION

1/2"=1'-0"

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILTY OF THE CONTRACTOR.

FOR BID ONLY
NOT FOR CONSTRUCTION

DRAWING LOG

NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	7/2/20	FOR BID ONLY, NOT FOR CONSTRUCTION

UNITED CONCRETE PRODUCTS

UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	FOR BID ONLY, NOT FOR CONSTRUCTION
JOB NAME:	Telecom Shelter Specification
JOB LOCATION:	Old Lyman Road
DWG TITLE:	FOR BID ONLY, NOT FOR CONSTRUCTION

DRAWN BY: KMB	DATE: 7/02/20	PM CHK'D: PN	DATE:
CAD CHK'D:	DATE:	GM CHK'D: SK	DATE: 7/02/20
JOB NO: 9610	SCALE: 1/2"=1'-0"	DRAWING NO: A-2	

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

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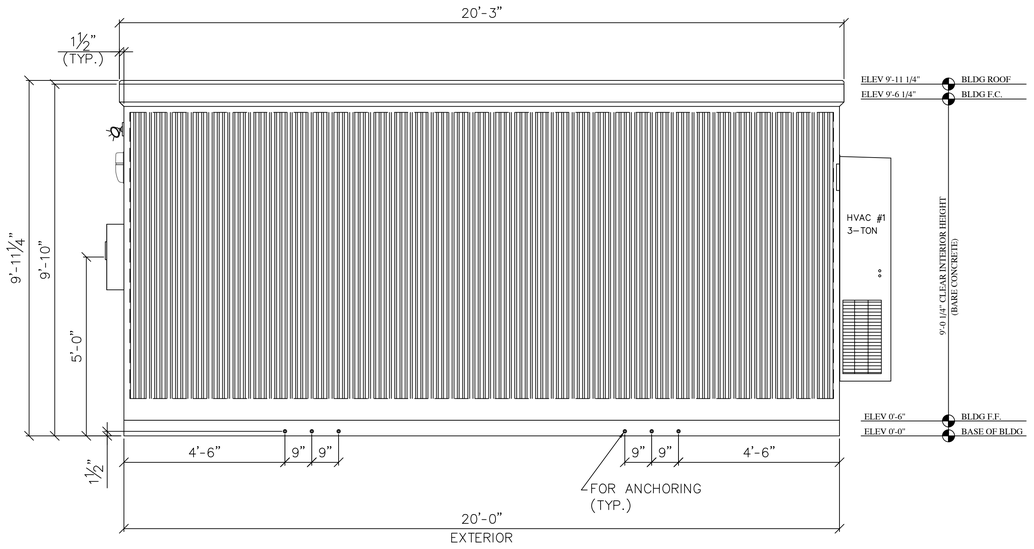
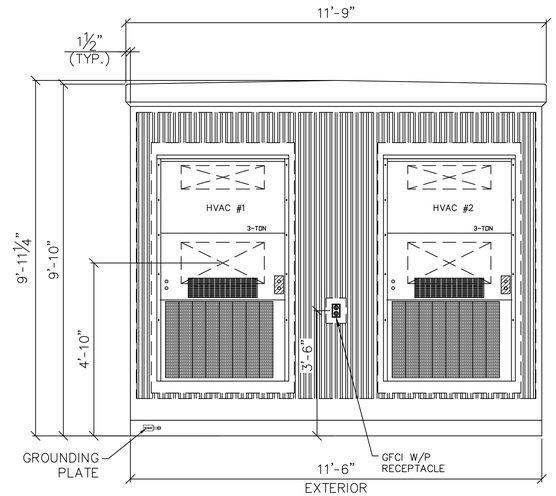
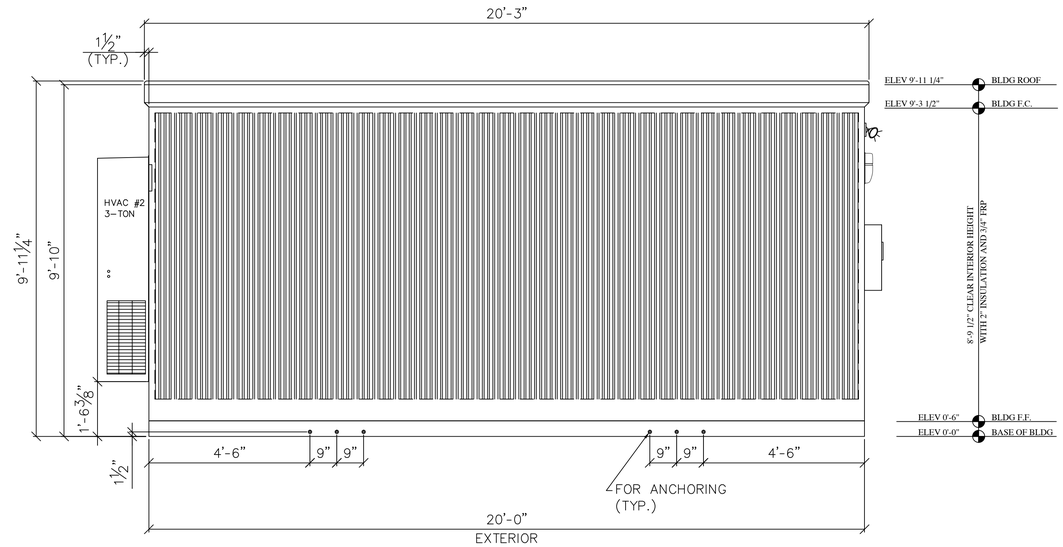


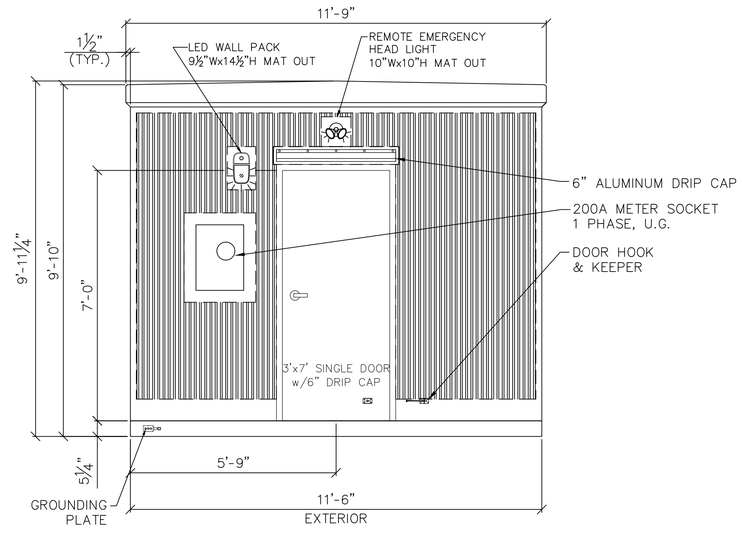
A EXTERIOR ELEVATION
1/2"=1'-0"



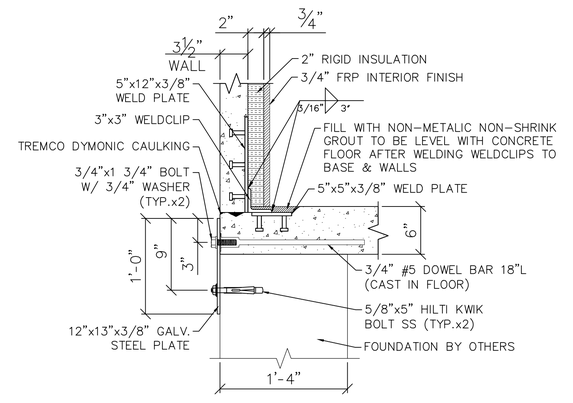
B EXTERIOR ELEVATION
1/2"=1'-0"



C EXTERIOR ELEVATION
1/2"=1'-0"



D EXTERIOR ELEVATION
1/2"=1'-0"



1 SUGGESTED FOUNDATION DETAIL
NTS

FOR BID ONLY
NOT FOR CONSTRUCTION

DRAWING LOG

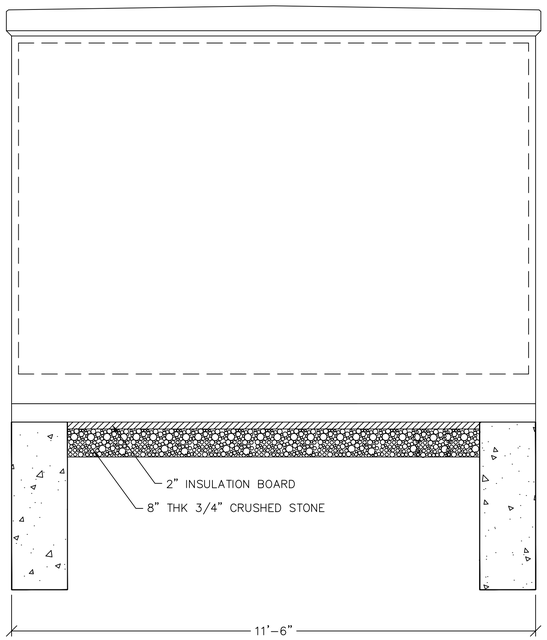
NUMBER	DATE	DESCRIPTION
4		
3		
2		
1	7/2/20	FOR BID ONLY, NOT FOR CONSTRUCTION

UNITED CONCRETE PRODUCTS

UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

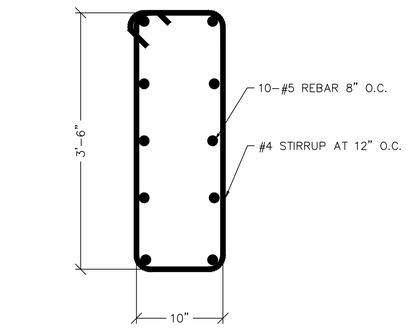
CUSTOMER:	FOR BID ONLY, NOT FOR CONSTRUCTION
JOB NAME:	Telecom Shelter Specification
JOB LOCATION:	Old Lyman Road
DWG TITLE:	FOR BID ONLY, NOT FOR CONSTRUCTION

DRAWN BY: KMB	DATE: 7/02/20	PM CHK'D: PN	DATE:
CAD CHK'D:	DATE:	GM CHK'D: SK	DATE: 7/02/20
JOB NO: 9610	SCALE: 1/2"=1'-0"	DRAWING NO: A-3	

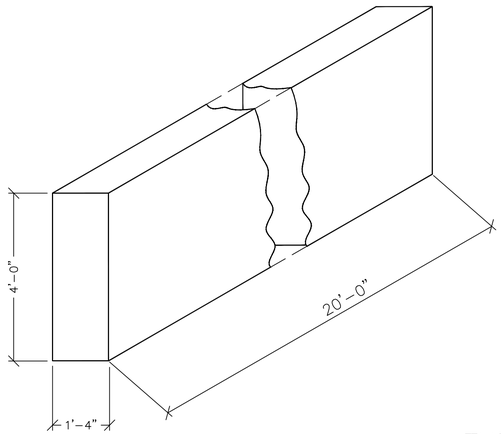


A GRADE BEAM ELEVATION
NTS

NOTES:
1. 3000 PSI SOIL BEARING CAPACITY ASSUMED.
2. ALL DIMENSIONS NOMINAL.

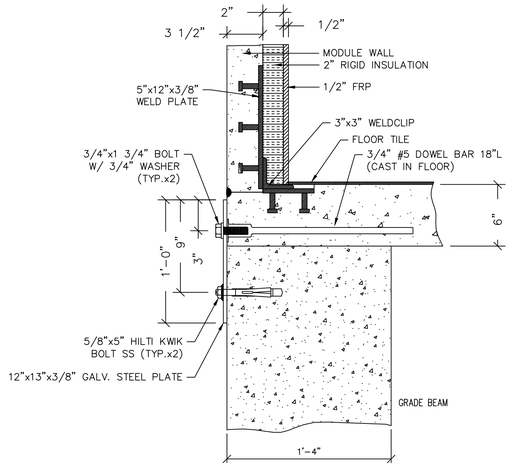


B REBAR CAGE
NTS

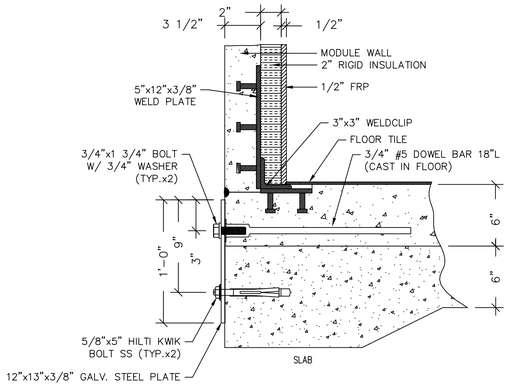


C GRADE BEAM ISO
NTS

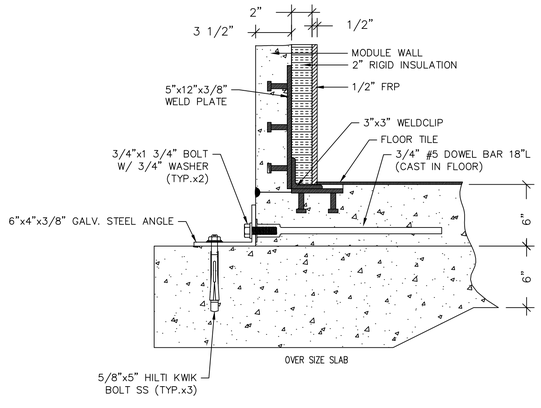
THESE FOUNDATION DRAWINGS ARE MERELY SUGGESTIONS. U.C.P. ASSUMES NO RESPONSIBILITY FOR THE FOUNDATION OF THE BUILDING. LOCAL CODE SHOULD BE FOLLOWED IN CREATING THE FOUNDATION FOR THE BUILDING.



D FLOOR TO FOUNDATION CONNECTION
NTS



E FLOOR TO SLAB CONNECTION
NTS



F FLOOR TO OVER SIZE SLAB
NTS

FOR BID ONLY
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DRAWING LOG

NUMBER	DATE	DESCRIPTION
4		
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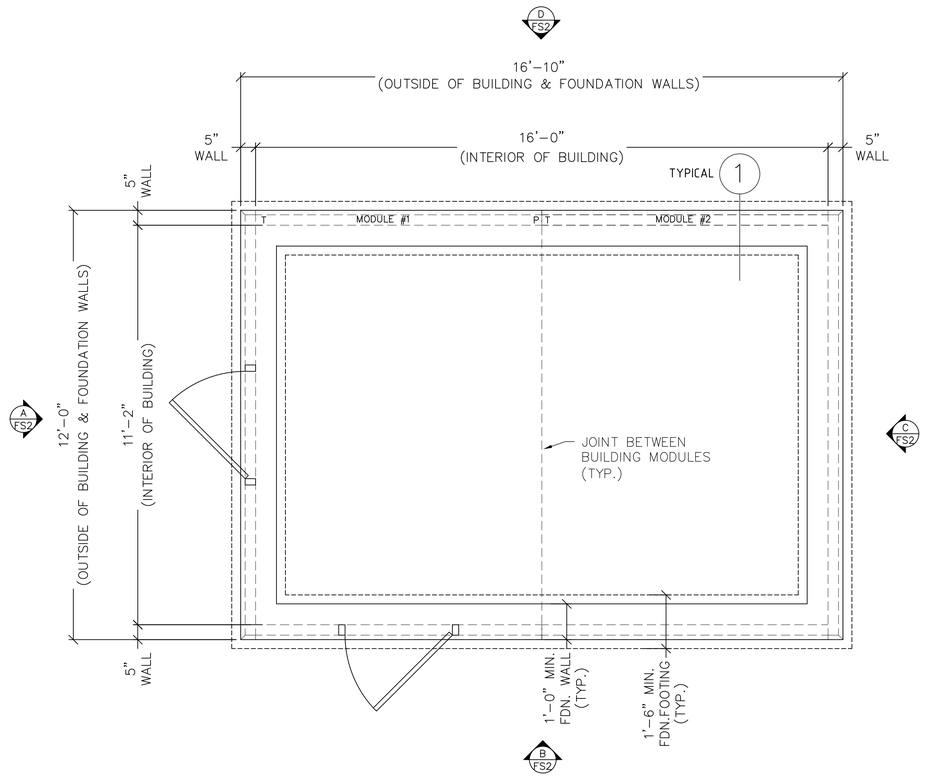
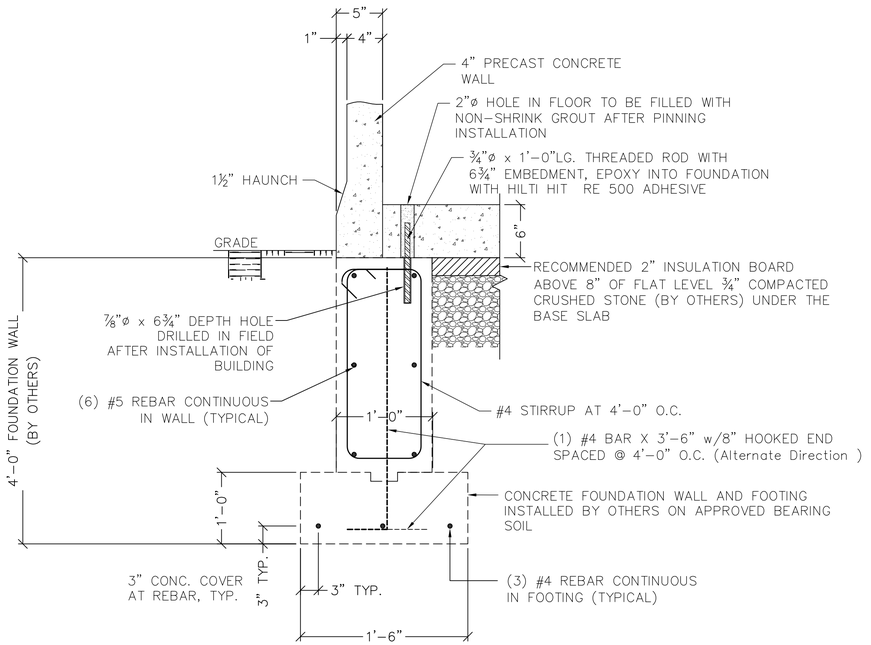
CAD CHK'D:	DATE:	GM CHK'D: SK	DATE: 7/02/20
JOB NO: 9610	SCALE: N.T.S.	DRAWING NO: A-4	

FOUNDATIONS ARE BASED ON THE FOLLOWING

1. MINIMUM 3000 PSI SOIL BEARING.
2. TOTAL BUILDING MAXIM WEIGHT OF BUILDING 75,000 LBS.
3. MAXIMUM BUILDING WIDTH OF 16'.
4. LARGER BUILDING FOOT PRINTS MAY REQUIRE ADDITIONAL INTERIOR WALLS OR MODIFICATIONS.



E PLAN VIEW
SPREAD FOOTING FOUNDATION 1/2"=1'–0"



SECTION 1
SUGGESTED FOUNDATION DETAIL
SPREAD FOOTING FOUNDATION
(N.T.S.)

REV	DATE	ECO	BY	DESCRIPTION
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.	.	.	.	.

REVISIONS

D SIZE SCALE: 1/2" = 1'–0"
B SIZE SCALE: NTS

SIGNATURE	DATE
DRWN BY: .	.
CHKD BY: .	
APVD BY: .	
REFERENCE DRAWING	

UNITED CONCRETE PRODUCTS
UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

SPECIAL FEATURES	.	
HVAC	.	
ELECTRICAL	.	
FUNCTION	.	
SHELTER/WEIGHT SHELTER ONLY	MM	LBS

GENERAL SPECIFICATIONS

CUSTOMER
.
.

DRAWING TITLE: SPREAD FOOTING FOUNDATION SUGGESTIONS
DRAWING NO. . REVISION
SHEET. NO. FS3

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT

Contract Number: 2020-1A **City/Town:** SOUTH HADLEY

Description of Work: Telecom Substation Improvements - Installation Contract for the South Hadley Electric Light Dept Telecom Central Office Upgrades and Construction for College Street and Old Lyman Road Locations

Job Location: 85 Main St, South Hadley, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Issue Date: 07/02/2020 **Wage Request Number:** 20200702-024

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.15	$12.41	$13.72	$0.00	$61.28
	08/01/2020	$35.15	$12.91	$13.72	$0.00	$61.78
	12/01/2020	$35.15	$12.91	$14.82	$0.00	$62.88
	06/01/2021	$35.95	$12.91	$14.82	$0.00	$63.68
	08/01/2021	$35.95	$13.41	$14.82	$0.00	$64.18
	12/01/2021	$35.95	$13.41	$16.01	$0.00	$65.37
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.22	$12.41	$13.72	$0.00	$61.35
	08/01/2020	$35.22	$12.91	$13.72	$0.00	$61.85
	12/01/2020	$35.22	$12.91	$14.82	$0.00	$62.95
	06/01/2021	$36.02	$12.91	$14.82	$0.00	$63.75
	08/01/2021	$36.02	$13.41	$14.82	$0.00	$64.25
	12/01/2021	$36.02	$13.41	$16.01	$0.00	$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.34	$12.41	$13.72	$0.00	$61.47
	08/01/2020	$35.34	$12.91	$13.72	$0.00	$61.97
	12/01/2020	$35.34	$12.91	$14.82	$0.00	$63.07
	06/01/2021	$36.14	$12.91	$14.82	$0.00	$63.87
	08/01/2021	$36.14	$13.41	$14.82	$0.00	$64.37
	12/01/2021	$36.14	$13.41	$16.01	$0.00	$65.56
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$32.25	$8.10	$14.78	$0.00	$55.13
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$32.25	$8.60	$13.03	$0.00	$53.88
	12/01/2020	$33.06	$8.60	$13.03	$0.00	$54.69
	06/01/2021	$33.90	$8.60	$13.03	$0.00	$55.53
	12/01/2021	$34.73	$8.60	$13.03	$0.00	$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)*	06/01/2020	$34.20	$12.50	$8.35	$0.00	$55.05
	12/01/2020	$35.10	$12.50	$8.35	$0.00	$55.95
ASPHALT RAKER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$32.25	$8.10	$14.78	$0.00	$55.13
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$32.25	$8.60	$13.03	$0.00	$53.88
	12/01/2020	$33.06	$8.60	$13.03	$0.00	$54.69
	06/01/2021	$33.90	$8.60	$13.03	$0.00	$55.53
	12/01/2021	$34.73	$8.60	$13.03	$0.00	$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$29.97	$7.07	$11.69	$0.00	$48.73
2	65	$29.97	$7.07	$11.69	$0.00	$48.73
3	70	$32.27	$7.07	$12.59	$0.00	$51.93
4	75	$34.58	$7.07	$13.49	$0.00	$55.14
5	80	$36.88	$7.07	$14.38	$0.00	$58.33
6	85	$39.19	$7.07	$15.29	$0.00	$61.55
7	90	$41.49	$7.07	$16.18	$0.00	$64.74
8	95	$43.80	$7.07	$17.09	$0.00	$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)*	02/01/2020	$42.81	$10.75	$19.96	$0.00	$73.52
	08/01/2020	$44.16	$10.75	$20.11	$0.00	$75.02
	02/01/2021	$44.71	$10.75	$20.11	$0.00	$75.57
	08/01/2021	$46.11	$10.75	$20.27	$0.00	$77.13
	02/01/2022	$46.64	$10.75	$20.27	$0.00	$77.66

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.41	$10.75	$19.96	$0.00	$52.12
2	60	$25.69	$10.75	$19.96	$0.00	$56.40
3	70	$29.97	$10.75	$19.96	$0.00	$60.68
4	80	$34.25	$10.75	$19.96	$0.00	$64.96
5	90	$38.53	$10.75	$19.96	$0.00	$69.24

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.08	$10.75	$20.11	$0.00	$52.94
2	60	$26.50	$10.75	$20.11	$0.00	$57.36
3	70	$30.91	$10.75	$20.11	$0.00	$61.77
4	80	$35.33	$10.75	$20.11	$0.00	$66.19
5	90	$39.74	$10.75	$20.11	$0.00	$70.60

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL*OPERATING*	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
ENGINEERS LOCAL 98						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN	06/01/2020	$40.30	$8.60	$17.24	$0.00	$66.14
LABORERS - FOUNDATION AND MARINE	12/01/2020	$41.28	$8.60	$17.24	$0.00	$67.12
	06/01/2021	$42.30	$8.60	$17.24	$0.00	$68.14
	12/01/2021	$43.31	$8.60	$17.24	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
LABORERS - FOUNDATION AND MARINE	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
LABORERS - FOUNDATION AND MARINE	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
LABORERS - ZONE 3 (BUILDING & SITE)						
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER *CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN*	03/01/2020	$38.04	$7.84	$16.87	$0.00	$62.75
	09/01/2020	$38.54	$7.84	$16.87	$0.00	$63.25
	03/01/2021	$39.04	$7.84	$16.87	$0.00	$63.75
	09/01/2021	$39.54	$7.84	$16.87	$0.00	$64.25
	03/01/2022	$40.04	$7.84	$16.87	$0.00	$64.75
	09/01/2022	$40.54	$7.84	$16.87	$0.00	$65.25
	03/01/2023	$41.04	$7.84	$16.87	$0.00	$65.75

Apprentice - *CARPENTER - Local 336 Hampden Hampshire Franklin*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.02	$7.84	$1.32	$0.00	$28.18
2	60	$22.82	$7.84	$1.32	$0.00	$31.98
3	70	$26.63	$7.84	$12.91	$0.00	$47.38
4	75	$28.53	$7.84	$12.91	$0.00	$49.28
5	80	$30.43	$7.84	$14.23	$0.00	$52.50
6	80	$30.43	$7.84	$14.23	$0.00	$52.50
7	90	$34.24	$7.84	$15.55	$0.00	$57.63
8	90	$34.24	$7.84	$15.55	$0.00	$57.63

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.27	$7.84	$1.32	$0.00	$28.43
2	60	$23.12	$7.84	$1.32	$0.00	$32.28
3	70	$26.98	$7.84	$12.91	$0.00	$47.73
4	75	$28.91	$7.84	$12.91	$0.00	$49.66
5	80	$30.83	$7.84	$14.23	$0.00	$52.90
6	80	$30.83	$7.84	$14.23	$0.00	$52.90
7	90	$34.69	$7.84	$15.55	$0.00	$58.08
8	90	$34.69	$7.84	$15.55	$0.00	$58.08

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $26.28/ 3&4 $31.36/ 5&6 $48.70/ 7&8 $53.82

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN*	10/01/2019	$23.49	$7.07	$7.86	$0.00	$38.42

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - 336 Hampden Hampshire*

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$14.09	$7.07	$0.00	$0.00	$21.16
2	60	$14.09	$7.07	$0.00	$0.00	$21.16
3	65	$15.27	$7.07	$7.86	$0.00	$30.20
4	70	$16.44	$7.07	$7.86	$0.00	$31.37
5	75	$17.62	$7.07	$7.86	$0.00	$32.55
6	80	$18.79	$7.07	$7.86	$0.00	$33.72
7	85	$19.97	$7.07	$7.86	$0.00	$34.90
8	90	$21.14	$7.07	$7.86	$0.00	$36.07

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $17.64/ 3&4 $24.74/ 5&6 $31.37/ 7&8 $33.72

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)

01/01/2020	$41.94	$12.70	$17.64	$0.62	$72.90

Apprentice - *CEMENT MASONRY/PLASTERING - Springfield/Pittsfield*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.97	$12.70	$15.41	$0.00	$49.08
2	60	$25.16	$12.70	$17.64	$0.62	$56.12
3	65	$27.26	$12.70	$17.64	$0.62	$58.22
4	70	$29.36	$12.70	$17.64	$0.62	$60.32
5	75	$31.46	$12.70	$17.64	$0.62	$62.42
6	80	$33.55	$12.70	$17.64	$0.62	$64.51
7	90	$37.75	$12.70	$17.64	$0.62	$68.71

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR
LABORERS - ZONE 3 (BUILDING & SITE)

12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63

For apprentice rates see "Apprentice- LABORER"

COMPRESSOR OPERATOR
OPERATING ENGINEERS LOCAL 98

12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CRANE OPERATOR
OPERATING ENGINEERS LOCAL 98

12/01/2019	$38.90	$11.94	$14.35	$0.00	$65.19

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

DELEADER (BRIDGE)
PAINTERS LOCAL 35 - ZONE 3

07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN — 12/01/2019 — $39.30 — $8.10 — $16.60 — $0.00 — $64.00
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR — 12/01/2019 — $40.30 — $8.10 — $16.60 — $0.00 — $65.00
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS — 12/01/2019 — $40.05 — $8.10 — $16.60 — $0.00 — $64.75
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DEMO: CONCRETE CUTTER/SAWYER — 12/01/2019 — $40.30 — $8.10 — $16.60 — $0.00 — $65.00
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DEMO: JACKHAMMER OPERATOR — 12/01/2019 — $40.05 — $8.10 — $16.60 — $0.00 — $64.75
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DEMO: WRECKING LABORER — 12/01/2019 — $39.30 — $8.10 — $16.60 — $0.00 — $64.00
LABORERS - ZONE 3 (BUILDING & SITE)
For apprentice rates see "Apprentice- LABORER"

DIVER — 08/01/2019 — $68.52 — $9.90 — $21.15 — $0.00 — $99.57
PILE DRIVER LOCAL 56 (ZONE 3)

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$73.41	$9.90	$21.15	$0.00	$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
ELECTRICIAN (Including Core Drilling) *ELECTRICIANS LOCAL 7*	06/28/2020	$44.01	$11.25	$12.82	$0.00	$68.08
	01/03/2021	$44.61	$11.50	$12.99	$0.00	$69.10
	06/27/2021	$45.21	$11.75	$13.26	$0.00	$70.22
	01/02/2022	$45.81	$12.00	$13.42	$0.00	$71.23
	07/03/2022	$46.41	$12.25	$13.69	$0.00	$72.35
	01/01/2023	$47.01	$12.50	$13.96	$0.00	$73.47

Apprentice - *ELECTRICIAN - Local 7*

Effective Date - 06/28/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.60	$6.15	$0.53	$0.00	$24.28
2	45	$19.80	$6.15	$0.59	$0.00	$26.54
3	50	$22.01	$11.25	$6.96	$0.00	$40.22
4	55	$24.21	$11.25	$7.03	$0.00	$42.49
5	65	$28.61	$11.25	$8.72	$0.00	$48.58
6	70	$30.81	$11.25	$9.82	$0.00	$51.88

Effective Date - 01/03/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.84	$6.90	$0.54	$0.00	$25.28
2	45	$20.07	$6.90	$0.60	$0.00	$27.57
3	50	$22.31	$11.50	$7.02	$0.00	$40.83
4	55	$24.54	$11.50	$7.09	$0.00	$43.13
5	65	$29.00	$11.50	$8.81	$0.00	$49.31
6	70	$31.23	$11.50	$9.94	$0.00	$52.67

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3****

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 41*	01/01/2020	$54.85	$15.73	$18.41	$0.00	$88.99
	01/01/2021	$56.69	$15.88	$19.31	$0.00	$91.88
	01/01/2022	$58.62	$16.03	$20.21	$0.00	$94.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 41*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.43	$15.73	$0.00	$0.00	$43.16
2	55	$30.17	$15.73	$18.41	$0.00	$64.31
3	65	$35.65	$15.73	$18.41	$0.00	$69.79
4	70	$38.40	$15.73	$18.41	$0.00	$72.54
5	80	$43.88	$15.73	$18.41	$0.00	$78.02

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.35	$15.88	$0.00	$0.00	$44.23
2	55	$31.18	$15.88	$19.31	$0.00	$66.37
3	65	$36.85	$15.88	$19.31	$0.00	$72.04
4	70	$39.68	$15.88	$19.31	$0.00	$74.87
5	80	$45.35	$15.88	$19.31	$0.00	$80.54

Notes:
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 41*	01/01/2020	$38.40	$15.73	$18.41	$0.00	$72.54
	01/01/2021	$39.68	$15.88	$19.31	$0.00	$74.87
	01/01/2022	$41.03	$16.03	$20.21	$0.00	$77.27
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 98*	06/01/1999	$18.84	$4.80	$4.10	$0.00	$27.74
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 98*	06/01/1999	$21.33	$4.80	$4.10	$0.00	$30.23
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 98*	06/01/1999	$22.33	$4.80	$4.10	$0.00	$31.23
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 7*	06/28/2020	$44.01	$11.25	$12.82	$0.00	$68.08
	01/03/2021	$44.61	$11.50	$12.99	$0.00	$69.10
	06/27/2021	$45.21	$11.75	$13.26	$0.00	$70.22
	01/02/2022	$45.81	$12.00	$13.42	$0.00	$71.23
	07/03/2022	$46.41	$12.25	$13.69	$0.00	$72.35
	01/01/2023	$47.01	$12.50	$13.96	$0.00	$73.47
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS LOCAL 7*	06/28/2020	$44.01	$11.25	$12.82	$0.00	$68.08
	01/03/2021	$44.61	$11.50	$12.99	$0.00	$69.10
	06/27/2021	$45.21	$11.75	$13.26	$0.00	$70.22
	01/02/2022	$45.81	$12.00	$13.42	$0.00	$71.23
	07/03/2022	$46.41	$12.25	$13.69	$0.00	$72.35
	01/01/2023	$47.01	$12.50	$13.96	$0.00	$73.47
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16

Apprentice - *OPERATING ENGINEERS - Local 98 Class 3*

Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$20.92	$11.94	$14.35	$0.00	$47.21
2	70	$24.41	$11.94	$14.35	$0.00	$50.70
3	80	$27.90	$11.94	$14.35	$0.00	$54.19
4	90	$31.38	$11.94	$14.35	$0.00	$57.67

Notes:
Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

Apprentice to Journeyworker Ratio:1:6

FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$23.50	$8.60	$13.03	$0.00	$45.13
	12/01/2020	$24.50	$8.60	$13.03	$0.00	$46.13
	06/01/2021	$24.50	$8.60	$13.03	$0.00	$46.13
	12/01/2021	$24.50	$8.60	$13.03	$0.00	$46.13
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE III*	09/01/2019	$37.44	$7.84	$16.87	$0.00	$62.15

Apprentice - *FLOORCOVERER - Local 2168 Zone III*

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.72	$7.84	$1.32	$0.00	$27.88
2	55	$20.59	$7.84	$1.32	$0.00	$29.75
3	60	$22.46	$7.84	$12.91	$0.00	$43.21
4	65	$24.34	$7.84	$12.91	$0.00	$45.09
5	70	$26.21	$7.84	$14.23	$0.00	$48.28
6	75	$28.08	$7.84	$14.23	$0.00	$50.15
7	80	$29.95	$7.84	$15.55	$0.00	$53.34
8	85	$31.82	$7.84	$15.55	$0.00	$55.21

Notes: Steps are 750 hrs.
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $26.01/ 3&4 $31.03/ 5&6 $48.28/ 7&8 $53.34

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$35.09	$11.94	$14.35	$0.00	$61.38
GENERATORS/LIGHTING PLANTS *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$31.64	$11.94	$14.35	$0.00	$57.93
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

GRADER/TRENCHING MACHINE/DERRICK *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 63* For apprentice rates see "Apprentice- SHEET METAL WORKER"	01/01/2020	$36.99	$10.64	$16.22	$1.77	$65.62
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 7*	06/28/2020	$44.01	$11.25	$12.82	$0.00	$68.08
	01/03/2021	$44.61	$11.50	$12.99	$0.00	$69.10
	06/27/2021	$45.21	$11.75	$13.26	$0.00	$70.22
	01/02/2022	$45.81	$12.00	$13.42	$0.00	$71.23
	07/03/2022	$46.41	$12.25	$13.69	$0.00	$72.35
	01/01/2023	$47.01	$12.50	$13.96	$0.00	$73.47
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 63* For apprentice rates see "Apprentice- SHEET METAL WORKER"	01/01/2020	$36.99	$10.64	$16.22	$1.77	$65.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 104*	03/17/2020	$41.71	$9.05	$16.35	$0.00	$67.11
	09/17/2020	$42.71	$9.05	$16.35	$0.00	$68.11
	03/17/2021	$43.71	$9.05	$16.35	$0.00	$69.11
	09/17/2021	$44.71	$9.05	$16.35	$0.00	$70.11
	03/17/2022	$45.96	$9.05	$16.35	$0.00	$71.36
	09/17/2022	$46.96	$9.05	$16.35	$0.00	$72.36
	03/17/2023	$48.21	$9.05	$16.35	$0.00	$73.61
	09/17/2023	$49.21	$9.05	$16.35	$0.00	$74.61
	03/17/2024	$50.46	$9.05	$16.35	$0.00	$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 104*	03/17/2020	$41.71	$9.05	$16.35	$0.00	$67.11
	09/17/2020	$42.71	$9.05	$16.35	$0.00	$68.11
	03/17/2021	$43.71	$9.05	$16.35	$0.00	$69.11
	09/17/2021	$44.71	$9.05	$16.35	$0.00	$70.11
	03/17/2022	$45.96	$9.05	$16.35	$0.00	$71.36
	09/17/2022	$46.96	$9.05	$16.35	$0.00	$72.36
	03/17/2023	$48.21	$9.05	$16.35	$0.00	$73.61
	09/17/2023	$49.21	$9.05	$16.35	$0.00	$74.61
	03/17/2024	$50.46	$9.05	$16.35	$0.00	$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$32.25	$8.60	$13.03	$0.00	$53.88
	12/01/2020	$33.06	$8.60	$13.03	$0.00	$54.69
	06/01/2021	$33.90	$8.60	$13.03	$0.00	$55.53
	12/01/2021	$34.73	$8.60	$13.03	$0.00	$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)*	09/01/2019	$38.75	$12.80	$16.40	$0.00	$67.95

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield*

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.38	$12.80	$11.90	$0.00	$44.08
2	60	$23.25	$12.80	$12.80	$0.00	$48.85
3	70	$27.13	$12.80	$13.70	$0.00	$53.63
4	80	$31.00	$12.80	$14.60	$0.00	$58.40

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)*	03/16/2020	$35.95	$8.00	$20.75	$0.00	$64.70
	09/16/2020	$36.85	$8.00	$20.75	$0.00	$65.60
	03/16/2021	$37.70	$8.00	$20.75	$0.00	$66.45

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Springfield*

Effective Date - 03/16/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.57	$8.00	$20.75	$0.00	$50.32
2	70	$25.17	$8.00	$20.75	$0.00	$53.92
3	75	$26.96	$8.00	$20.75	$0.00	$55.71
4	80	$28.76	$8.00	$20.75	$0.00	$57.51
5	85	$30.56	$8.00	$20.75	$0.00	$59.31
6	90	$32.36	$8.00	$20.75	$0.00	$61.11

Effective Date - 09/16/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$22.11	$8.00	$20.75	$0.00	$50.86
2	70	$25.80	$8.00	$20.75	$0.00	$54.55
3	75	$27.64	$8.00	$20.75	$0.00	$56.39
4	80	$29.48	$8.00	$20.75	$0.00	$58.23
5	85	$31.32	$8.00	$20.75	$0.00	$60.07
6	90	$33.17	$8.00	$20.75	$0.00	$61.92

Notes:
Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.50	$8.10	$14.78	$0.00	$54.38

Apprentice - *LABORER - Zone 3 Building & Site*

Effective Date - 12/02/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$18.90	$8.10	$14.78	$0.00	$41.78
2	70	$22.05	$8.10	$14.78	$0.00	$44.93
3	80	$25.20	$8.10	$14.78	$0.00	$48.08
4	90	$28.35	$8.10	$14.78	$0.00	$51.23

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.50	$8.60	$13.03	$0.00	$53.13
	12/01/2020	$32.31	$8.60	$13.03	$0.00	$53.94
	06/01/2021	$33.15	$8.60	$13.03	$0.00	$54.78
	12/01/2021	$33.98	$8.60	$13.03	$0.00	$55.61

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER (Heavy & Highway) - Zone 3*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$18.90	$8.60	$13.03	$0.00	$40.53
2	70	$22.05	$8.60	$13.03	$0.00	$43.68
3	80	$25.20	$8.60	$13.03	$0.00	$46.83
4	90	$28.35	$8.60	$13.03	$0.00	$49.98

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$19.39	$8.60	$13.03	$0.00	$41.02
2	70	$22.62	$8.60	$13.03	$0.00	$44.25
3	80	$25.85	$8.60	$13.03	$0.00	$47.48
4	90	$29.08	$8.60	$13.03	$0.00	$50.71

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.50	$8.10	$14.78	$0.00	$54.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 3 (BUILDING & SITE)*	06/01/2020	$31.60	$8.60	$15.09	$0.00	$55.29
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$32.50	$8.10	$14.78	$0.00	$55.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.50	$8.10	$14.78	$0.00	$54.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.50	$8.10	$14.78	$0.00	$54.38
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE*	02/01/2020	$35.17	$10.75	$19.37	$0.00	$65.29
	08/01/2020	$36.17	$10.75	$19.49	$0.00	$66.41
	02/01/2021	$36.67	$10.75	$19.49	$0.00	$66.91
	08/01/2021	$37.67	$10.75	$19.62	$0.00	$68.04
	02/01/2022	$38.12	$10.75	$19.62	$0.00	$68.49

Apprentice - *MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.59	$10.75	$19.37	$0.00	$47.71
2	60	$21.10	$10.75	$19.37	$0.00	$51.22
3	70	$24.62	$10.75	$19.37	$0.00	$54.74
4	80	$28.14	$10.75	$19.37	$0.00	$58.26
5	90	$31.65	$10.75	$19.37	$0.00	$61.77

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.09	$10.75	$19.49	$0.00	$48.33
2	60	$21.70	$10.75	$19.49	$0.00	$51.94
3	70	$25.32	$10.75	$19.49	$0.00	$55.56
4	80	$28.94	$10.75	$19.49	$0.00	$59.18
5	90	$32.55	$10.75	$19.49	$0.00	$62.79

Notes:

Apprentice to Journeyworker Ratio:1:5

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANIC/WELDER/BOOM TRUCK *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 3) *MILLWRIGHTS LOCAL 1121 - Zone 3*	04/01/2019	$37.11	$9.90	$18.50	$0.00	$65.51

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 3*

Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$20.41	$9.90	$5.31	$0.00	$35.62
2	65	$24.12	$9.90	$15.13	$0.00	$49.15
3	75	$27.83	$9.90	$16.10	$0.00	$53.83
4	85	$31.54	$9.90	$17.06	$0.00	$58.50

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
OILER *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$30.56	$11.94	$14.35	$0.00	$56.85
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$28.58	$11.94	$14.35	$0.00	$54.87
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 3*	07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	07/01/2020	$34.88	$8.25	$18.50	$0.00	$61.63
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 3*	01/01/2021	$35.43	$8.25	$18.85	$0.00	$62.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 3 - Spray/Sandblast - New*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.44	$8.25	$0.00	$0.00	$25.69
2	55	$19.18	$8.25	$3.91	$0.00	$31.34
3	60	$20.93	$8.25	$4.26	$0.00	$33.44
4	65	$22.67	$8.25	$4.62	$0.00	$35.54
5	70	$24.42	$8.25	$16.37	$0.00	$49.04
6	75	$26.16	$8.25	$16.73	$0.00	$51.14
7	80	$27.90	$8.25	$17.08	$0.00	$53.23
8	90	$31.39	$8.25	$17.79	$0.00	$57.43

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.72	$8.25	$0.00	$0.00	$25.97
2	55	$19.49	$8.25	$4.02	$0.00	$31.76
3	60	$21.26	$8.25	$4.38	$0.00	$33.89
4	65	$23.03	$8.25	$4.75	$0.00	$36.03
5	70	$24.80	$8.25	$16.66	$0.00	$49.71
6	75	$26.57	$8.25	$17.03	$0.00	$51.85
7	80	$28.34	$8.25	$17.39	$0.00	$53.98
8	90	$31.89	$8.25	$18.12	$0.00	$58.26

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 3*	07/01/2020	$32.20	$8.25	$18.50	$0.00	$58.95
	01/01/2021	$32.75	$8.25	$18.85	$0.00	$59.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.10	$8.25	$0.00	$0.00	$24.35
2	55	$17.71	$8.25	$3.91	$0.00	$29.87
3	60	$19.32	$8.25	$4.26	$0.00	$31.83
4	65	$20.93	$8.25	$4.62	$0.00	$33.80
5	70	$22.54	$8.25	$16.37	$0.00	$47.16
6	75	$24.15	$8.25	$16.73	$0.00	$49.13
7	80	$25.76	$8.25	$17.08	$0.00	$51.09
8	90	$28.98	$8.25	$17.79	$0.00	$55.02

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.38	$8.25	$0.00	$0.00	$24.63
2	55	$18.01	$8.25	$4.02	$0.00	$30.28
3	60	$19.65	$8.25	$4.38	$0.00	$32.28
4	65	$21.29	$8.25	$4.75	$0.00	$34.29
5	70	$22.93	$8.25	$16.66	$0.00	$47.84
6	75	$24.56	$8.25	$17.03	$0.00	$49.84
7	80	$26.20	$8.25	$17.39	$0.00	$51.84
8	90	$29.48	$8.25	$18.12	$0.00	$55.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	07/01/2020	$33.48	$8.25	$18.50	$0.00	$60.23
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 3*	01/01/2021	$34.03	$8.25	$18.85	$0.00	$61.13

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER - Local 35 Zone 3 - BRUSH NEW*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.74	$8.25	$0.00	$0.00	$24.99
2	55	$18.41	$8.25	$3.91	$0.00	$30.57
3	60	$20.09	$8.25	$4.26	$0.00	$32.60
4	65	$21.76	$8.25	$4.62	$0.00	$34.63
5	70	$23.44	$8.25	$16.37	$0.00	$48.06
6	75	$25.11	$8.25	$16.73	$0.00	$50.09
7	80	$26.78	$8.25	$17.08	$0.00	$52.11
8	90	$30.13	$8.25	$17.79	$0.00	$56.17

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.02	$8.25	$0.00	$0.00	$25.27
2	55	$18.72	$8.25	$4.02	$0.00	$30.99
3	60	$20.42	$8.25	$4.38	$0.00	$33.05
4	65	$22.12	$8.25	$4.75	$0.00	$35.12
5	70	$23.82	$8.25	$16.66	$0.00	$48.73
6	75	$25.52	$8.25	$17.03	$0.00	$50.80
7	80	$27.22	$8.25	$17.39	$0.00	$52.86
8	90	$30.63	$8.25	$18.12	$0.00	$57.00

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 3*	07/01/2020	$30.80	$8.25	$18.50	$0.00	$57.55
	01/01/2021	$31.35	$8.25	$18.85	$0.00	$58.45

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 3 - BRUSH REPAINT*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$15.40	$8.25	$0.00	$0.00	$23.65
2	55	$16.94	$8.25	$3.91	$0.00	$29.10
3	60	$18.48	$8.25	$4.26	$0.00	$30.99
4	65	$20.02	$8.25	$4.62	$0.00	$32.89
5	70	$21.56	$8.25	$16.37	$0.00	$46.18
6	75	$23.10	$8.25	$16.73	$0.00	$48.08
7	80	$24.64	$8.25	$17.08	$0.00	$49.97
8	90	$27.72	$8.25	$17.79	$0.00	$53.76

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$15.68	$8.25	$0.00	$0.00	$23.93
2	55	$17.24	$8.25	$4.02	$0.00	$29.51
3	60	$18.81	$8.25	$4.38	$0.00	$31.44
4	65	$20.38	$8.25	$4.75	$0.00	$33.38
5	70	$21.95	$8.25	$16.66	$0.00	$46.86
6	75	$23.51	$8.25	$17.03	$0.00	$48.79
7	80	$25.08	$8.25	$17.39	$0.00	$50.72
8	90	$28.22	$8.25	$18.12	$0.00	$54.59

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.50	$8.60	$13.03	$0.00	$53.13
	12/01/2020	$32.31	$8.60	$13.03	$0.00	$53.94
	06/01/2021	$33.15	$8.60	$13.03	$0.00	$54.78
	12/01/2021	$33.98	$8.60	$13.03	$0.00	$55.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$34.98	$12.41	$13.72	$0.00	$61.11
	08/01/2020	$34.98	$12.91	$13.72	$0.00	$61.61
	12/01/2020	$34.98	$12.91	$14.82	$0.00	$62.71
	06/01/2021	$35.78	$12.91	$14.82	$0.00	$63.51
	08/01/2021	$35.78	$13.41	$14.82	$0.00	$64.01
	12/01/2021	$35.78	$13.41	$16.01	$0.00	$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$43.79	$9.90	$21.15	$0.00	$74.84
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 3)*	08/01/2019	$43.79	$9.90	$21.15	$0.00	$74.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 3*

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: Apprentice wages shall be no less than the following Steps;
(Same as set in Zone 1)
1$54.34/2$58.99/3$63.65/4$65.98/5$68.31/6$68.31/7$72.96/8$72.96

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 3 (BUILDING & SITE)* For apprentice rates see "Apprentice- LABORER"	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 104*	03/17/2020	$41.71	$9.05	$16.35	$0.00	$67.11
	09/17/2020	$42.71	$9.05	$16.35	$0.00	$68.11
	03/17/2021	$43.71	$9.05	$16.35	$0.00	$69.11
	09/17/2021	$44.71	$9.05	$16.35	$0.00	$70.11
	03/17/2022	$45.96	$9.05	$16.35	$0.00	$71.36
	09/17/2022	$46.96	$9.05	$16.35	$0.00	$72.36
	03/17/2023	$48.21	$9.05	$16.35	$0.00	$73.61
	09/17/2023	$49.21	$9.05	$16.35	$0.00	$74.61
	03/17/2024	$50.46	$9.05	$16.35	$0.00	$75.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 104*

Effective Date - 03/17/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$18.77	$9.05	$9.60	$0.00	$37.42
2	50	$20.86	$9.05	$9.60	$0.00	$39.51
3	55	$22.94	$9.05	$9.60	$0.00	$41.59
4	60	$25.03	$9.05	$9.60	$0.00	$43.68
5	65	$27.11	$9.05	$9.60	$0.00	$45.76
6	70	$29.20	$9.05	$9.60	$0.00	$47.85
7	75	$31.28	$9.05	$9.60	$0.00	$49.93
8	80	$33.37	$9.05	$9.60	$0.00	$52.02
9	80	$33.37	$9.05	$16.35	$0.00	$58.77
10	80	$33.37	$9.05	$16.35	$0.00	$58.77

Effective Date - 09/17/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$19.22	$9.05	$9.60	$0.00	$37.87
2	50	$21.36	$9.05	$9.60	$0.00	$40.01
3	55	$23.49	$9.05	$9.60	$0.00	$42.14
4	60	$25.63	$9.05	$9.60	$0.00	$44.28
5	65	$27.76	$9.05	$9.60	$0.00	$46.41
6	70	$29.90	$9.05	$9.60	$0.00	$48.55
7	75	$32.03	$9.05	$9.60	$0.00	$50.68
8	80	$34.17	$9.05	$9.60	$0.00	$52.82
9	80	$34.17	$9.05	$16.35	$0.00	$59.57
10	80	$34.17	$9.05	$16.35	$0.00	$59.57

Notes: **1:1,2:5,3:9,4:12

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 104*	03/17/2020	$41.71	$9.05	$16.35	$0.00	$67.11
	09/17/2020	$42.71	$9.05	$16.35	$0.00	$68.11
	03/17/2021	$43.71	$9.05	$16.35	$0.00	$69.11
	09/17/2021	$44.71	$9.05	$16.35	$0.00	$70.11
	03/17/2022	$45.96	$9.05	$16.35	$0.00	$71.36
	09/17/2022	$46.96	$9.05	$16.35	$0.00	$72.36
	03/17/2023	$48.21	$9.05	$16.35	$0.00	$73.61
	09/17/2023	$49.21	$9.05	$16.35	$0.00	$74.61
	03/17/2024	$50.46	$9.05	$16.35	$0.00	$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$32.50	$8.10	$14.78	$0.00	$55.38
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$32.50	$8.60	$13.03	$0.00	$54.13
	12/01/2020	$33.31	$8.60	$13.03	$0.00	$54.94
	06/01/2021	$34.15	$8.60	$13.03	$0.00	$55.78
	12/01/2021	$34.98	$8.60	$13.03	$0.00	$56.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$35.40	$11.94	$14.35	$0.00	$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 404 - Construction Service (Northampton)*	05/01/2020	$22.44	$11.07	$6.50	$0.00	$40.01
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.26	$11.94	$14.35	$0.00	$60.55
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) *ROOFERS LOCAL 248*	07/16/2019	$32.66	$10.05	$16.20	$0.00	$58.91
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 248*	07/16/2019	$32.16	$10.05	$15.70	$0.00	$57.91

Apprentice - *ROOFER - Local 248*

Effective Date - 07/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$19.30	$10.05	$0.00	$0.00	$29.35
2	65	$20.90	$10.05	$15.70	$0.00	$46.65
3	70	$22.51	$10.05	$15.70	$0.00	$48.26
4	75	$24.12	$10.05	$15.70	$0.00	$49.87
5	80	$25.73	$10.05	$15.70	$0.00	$51.48
6	85	$27.34	$10.05	$15.70	$0.00	$53.09
7	90	$28.94	$10.05	$15.70	$0.00	$54.69
8	95	$30.55	$10.05	$15.70	$0.00	$56.30

Notes:
Steps are 750 hrs.Roofer(Tear Off)1:1; Same as above

Apprentice to Journeyworker Ratio:1:3

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 248*	07/16/2019	$32.66	$10.05	$16.20	$0.00	$58.91
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SCRAPER *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$34.87	$11.94	$14.35	$0.00	$61.16
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$34.26	$11.94	$14.35	$0.00	$60.55
SELF-PROPELLED POWER BROOM *OPERATING ENGINEERS LOCAL 98* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	$31.64	$11.94	$14.35	$0.00	$57.93
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 63*	01/01/2020	$36.99	$10.64	$16.22	$1.77	$65.62

Apprentice - *SHEET METAL WORKER - Local 63*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$16.65	$6.21	$4.67	$0.00	$27.53
2	50	$18.50	$6.55	$5.19	$0.00	$30.24
3	55	$20.34	$6.88	$9.33	$1.08	$37.63
4	60	$22.19	$7.22	$9.33	$1.14	$39.88
5	65	$24.04	$7.55	$9.33	$1.20	$42.12
6	70	$25.89	$7.88	$9.33	$1.27	$44.37
7	75	$27.74	$8.22	$9.33	$1.33	$46.62
8	80	$29.59	$9.30	$15.18	$1.59	$55.66
9	85	$31.44	$9.64	$15.18	$1.66	$57.92
10	90	$33.29	$9.98	$15.18	$1.72	$60.17

Notes:

Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.44	$12.41	$13.72	$0.00	$61.57
	08/01/2020	$35.44	$12.91	$13.72	$0.00	$62.07
	12/01/2020	$35.44	$12.91	$14.82	$0.00	$63.17
	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.73	$12.41	$13.72	$0.00	$61.86
	08/01/2020	$35.73	$12.91	$13.72	$0.00	$62.36
	12/01/2020	$35.73	$12.91	$14.82	$0.00	$63.46
	06/01/2021	$36.53	$12.91	$14.82	$0.00	$64.26
	08/01/2021	$36.53	$13.41	$14.82	$0.00	$64.76
	12/01/2021	$36.53	$13.41	$16.01	$0.00	$65.95
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 669*	01/01/2019	$41.51	$10.02	$13.08	$0.00	$64.61

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SPRINKLER FITTER - Local 669*

Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$18.68	$7.75	$0.00	$0.00	$26.43
2	50	$20.76	$7.75	$0.00	$0.00	$28.51
3	55	$22.83	$10.02	$7.25	$0.00	$40.10
4	60	$24.91	$10.02	$7.25	$0.00	$42.18
5	65	$26.98	$10.02	$7.50	$0.00	$44.50
6	70	$29.06	$10.02	$7.50	$0.00	$46.58
7	75	$31.13	$10.02	$7.50	$0.00	$48.65
8	80	$33.21	$10.02	$7.50	$0.00	$50.73
9	85	$35.28	$10.02	$7.50	$0.00	$52.80
10	90	$37.36	$10.02	$7.50	$0.00	$54.88

Notes:

Apprentice to Journeyworker Ratio:1:1

TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 7*	06/28/2020	$44.01	$11.25	$12.82	$0.00	$68.08
	01/03/2021	$44.61	$11.50	$12.99	$0.00	$69.10
	06/27/2021	$45.21	$11.75	$13.26	$0.00	$70.22
	01/02/2022	$45.81	$12.00	$13.42	$0.00	$71.23
	07/03/2022	$46.41	$12.25	$13.69	$0.00	$72.35
	01/01/2023	$47.01	$12.50	$13.96	$0.00	$73.47

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 7*

Effective Date - 06/28/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.60	$6.15	$0.53	$0.00	$24.28
2	45	$19.80	$6.15	$0.59	$0.00	$26.54
3	50	$22.01	$11.25	$6.96	$0.00	$40.22
4	55	$24.21	$11.25	$7.03	$0.00	$42.49
5	65	$28.61	$11.25	$8.72	$0.00	$48.58
6	70	$30.81	$11.25	$9.82	$0.00	$51.88

Effective Date - 01/03/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.84	$6.90	$0.54	$0.00	$25.28
2	45	$20.07	$6.90	$0.60	$0.00	$27.57
3	50	$22.31	$11.50	$7.02	$0.00	$40.83
4	55	$24.54	$11.50	$7.09	$0.00	$43.13
5	65	$29.00	$11.50	$8.78	$0.00	$49.28
6	70	$31.23	$11.50	$9.89	$0.00	$52.62

Notes:
Steps are 800 hours

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE*	02/01/2020	$53.34	$10.75	$21.94	$0.00	$86.03
	08/01/2020	$54.69	$10.75	$22.09	$0.00	$87.53
	02/01/2021	$55.33	$10.75	$22.09	$0.00	$88.17
	08/01/2021	$56.73	$10.75	$22.25	$0.00	$89.73
	02/01/2022	$57.32	$10.75	$22.25	$0.00	$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.67	$10.75	$21.94	$0.00	$59.36
2	60	$32.00	$10.75	$21.94	$0.00	$64.69
3	70	$37.34	$10.75	$21.94	$0.00	$70.03
4	80	$42.67	$10.75	$21.94	$0.00	$75.36
5	90	$48.01	$10.75	$21.94	$0.00	$80.70

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.35	$10.75	$22.09	$0.00	$60.19
2	60	$32.81	$10.75	$22.09	$0.00	$65.65
3	70	$38.28	$10.75	$22.09	$0.00	$71.12
4	80	$43.75	$10.75	$22.09	$0.00	$76.59
5	90	$49.22	$10.75	$22.09	$0.00	$82.06

Notes:

Apprentice to Journeyworker Ratio:1:5

TERRAZZO MECHANIC *BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE*	02/01/2020	$54.42	$10.75	$21.93	$0.00	$87.10
	08/01/2020	$55.77	$10.75	$22.08	$0.00	$88.60
	02/01/2021	$56.41	$10.75	$22.08	$0.00	$89.24
	08/01/2021	$57.81	$10.75	$22.24	$0.00	$90.80
	02/01/2022	$58.38	$10.75	$22.24	$0.00	$91.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.21	$10.75	$21.93	$0.00	$59.89
2	60	$32.65	$10.75	$21.93	$0.00	$65.33
3	70	$38.09	$10.75	$21.93	$0.00	$70.77
4	80	$43.54	$10.75	$21.93	$0.00	$76.22
5	90	$48.98	$10.75	$21.93	$0.00	$81.66

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.89	$10.75	$22.08	$0.00	$60.72
2	60	$33.46	$10.75	$22.08	$0.00	$66.29
3	70	$39.04	$10.75	$22.08	$0.00	$71.87
4	80	$44.62	$10.75	$22.08	$0.00	$77.45
5	90	$50.19	$10.75	$22.08	$0.00	$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$40.55	$8.60	$17.24	$0.00	$66.39
	12/01/2020	$41.53	$8.60	$17.24	$0.00	$67.37
	06/01/2021	$42.55	$8.60	$17.24	$0.00	$68.39
	12/01/2021	$43.56	$8.60	$17.24	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.27	$8.60	$17.24	$0.00	$65.11
	12/01/2020	$40.25	$8.60	$17.24	$0.00	$66.09
	06/01/2021	$41.27	$8.60	$17.24	$0.00	$67.11
	12/01/2021	$42.28	$8.60	$17.24	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS *OPERATING ENGINEERS LOCAL 98*	12/01/2019	$34.26	$11.94	$14.35	$0.00	$60.55
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$36.02	$12.41	$13.72	$0.00	$62.15
	08/01/2020	$36.02	$12.91	$13.72	$0.00	$62.65
	12/01/2020	$36.02	$12.91	$14.82	$0.00	$63.75
	06/01/2021	$36.82	$12.91	$14.82	$0.00	$64.55
	08/01/2021	$36.82	$13.41	$14.82	$0.00	$65.05
	12/01/2021	$36.82	$13.41	$16.01	$0.00	$66.24

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2020	$51.38	$8.60	$17.69	$0.00	$77.67
	12/01/2020	$52.36	$8.60	$17.69	$0.00	$78.65
	06/01/2021	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2021	$54.39	$8.60	$17.69	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2020	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2020	$54.36	$8.60	$17.69	$0.00	$80.65
	06/01/2021	$55.38	$8.60	$17.69	$0.00	$81.67
	12/01/2021	$56.39	$8.60	$17.69	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$43.45	$8.60	$17.69	$0.00	$69.74
	12/01/2020	$44.43	$8.60	$17.69	$0.00	$70.72
	06/01/2021	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2021	$46.46	$8.60	$17.69	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2020	$46.43	$8.60	$17.69	$0.00	$72.72
	06/01/2021	$47.45	$8.60	$17.69	$0.00	$73.74
	12/01/2021	$48.46	$8.60	$17.69	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.44	$12.41	$13.72	$0.00	$61.57
	08/01/2020	$35.44	$12.91	$13.72	$0.00	$62.07
	12/01/2020	$35.44	$12.91	$14.82	$0.00	$63.17
	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
WAGON DRILL OPERATOR *LABORERS - ZONE 3 (BUILDING & SITE)*	12/02/2019	$31.75	$8.10	$14.78	$0.00	$54.63
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 3 (HEAVY & HIGHWAY)*	06/01/2020	$31.75	$8.60	$13.03	$0.00	$53.38
	12/01/2020	$32.56	$8.60	$13.03	$0.00	$54.19
	06/01/2021	$33.40	$8.60	$13.03	$0.00	$55.03
	12/01/2021	$34.23	$8.60	$13.03	$0.00	$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER *PLUMBERS & PIPEFITTERS LOCAL 104*	03/17/2020	$41.71	$9.05	$16.35	$0.00	$67.11
	09/17/2020	$42.71	$9.05	$16.35	$0.00	$68.11
	03/17/2021	$43.71	$9.05	$16.35	$0.00	$69.11
	09/17/2021	$44.71	$9.05	$16.35	$0.00	$70.11
	03/17/2022	$45.96	$9.05	$16.35	$0.00	$71.36
	09/17/2022	$46.96	$9.05	$16.35	$0.00	$72.36
	03/17/2023	$48.21	$9.05	$16.35	$0.00	$73.61
	09/17/2023	$49.21	$9.05	$16.35	$0.00	$74.61
	03/17/2024	$50.46	$9.05	$16.35	$0.00	$75.86
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - West						
EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	09/01/2019	$44.67	$8.00	$12.55	$0.00	$65.22
For apprentice rates see "Apprentice- LINEMAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$30.58	$8.00	$5.48	$0.00	$44.06
GROUNDMAN / TRUCK DRIVER *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$39.97	$8.00	$10.96	$0.00	$58.93
HEAVY EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$47.01	$8.00	$13.22	$0.00	$68.23
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	09/01/2019	$51.71	$8.00	$15.55	$0.00	$75.26

Apprentice - *LINEMAN (Outside Electrical) - West Local 42*

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$31.03	$8.00	$3.43	$0.00	$42.46
2	65	$33.61	$8.00	$3.51	$0.00	$45.12
3	70	$36.20	$8.00	$3.59	$0.00	$47.79
4	75	$38.78	$8.00	$5.16	$0.00	$51.94
5	80	$41.37	$8.00	$5.24	$0.00	$54.61
6	85	$43.95	$8.00	$5.32	$0.00	$57.27
7	90	$46.54	$8.00	$7.40	$0.00	$61.94

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TRACTOR-TRAILER DRIVER *OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42*	09/01/2019	$44.67	$8.00	$12.55	$0.00	$65.22

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.