INVITATION FOR BIDS
GHTD IFB #01-026 (RE-BID)

ROOF DRAIN LINE REPAIR
AT HARTFORD UNION STATION

Greater Hartford Transit District
Union Station Transportation Facility Complex
One Union Place, Hartford, CT 06103

October 10, 2025

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NOTICE
GREATER HARTFORD TRANSIT DISTRICT
INVITATION FOR BIDS
GHTD IFB #01-026 (RE-BID)
ROOF DRAIN LINE REPAIRS
AT HARTFORD UNION STATION

The Greater Hartford Transit District (GHTD), Hartford, Connecticut, a municipal corporation formed under Chapter 103a of the Connecticut General Statutes, Revision of 1958, as amended, is seeking bids from a qualified firm or firms for the provision of a licensed contractor to repair the existing roof drain line system located at the Union Station Transportation Facility Complex, which is located at One Union Place, Hartford, CT 06103. The primary scope of work will consist of replacing and rerouting the existing storm drain lines with new drain lines and the addition of secondary drains. At the roof level, new secondary (emergency) overflow drains will be installed. At the attic level, existing vertical drain lines will be cut and capped, and new drain lines will run into the lower floors, enclosed in a new chase. At the first-floor level, there will be limited demolition of the masonry and brownstone to install two emergency overflow outlets, one at each of the vestibules to the side of the Great Hall. The primary drains will continue below grade, one vertical line at each of the vestibules, and will connect at a new manhole below the sidewalk. Downstream of the new storm manhole, the existing drain line that connects to the Gully Brook storm sewer will be removed and replaced with a new pipe. All drainage work outside of the building will involve demolition of the concrete sidewalk panels and pavers and roadway asphalt to install new pipe. The hardscaping of the site will be restored to the existing conditions. Due to Union Station's historic nature, the successful bidder will be required to coordinate with the State Historic Preservation Office (SHPO) for all brownstone masonry repairs and demolition. All work details are indicated in the Bid Documents.

Bid documents including drawings and specifications will be available on or **after Friday, October 10, 2025**. Bid documents will be available on the District's website at: https://www.hartfordtransit.org/business-opportunities/ and on the State of Connecticut DAS Contracting Portal at https://portal.ct.gov/DAS/CTSource/CTSource.

Bids shall be submitted to LaShaunda Drake, Contract and Procurement Specialist, Greater Hartford Transit District, One Union Place, Hartford, CT. 06103, on or before **10:00 a.m. local time on Friday, November 21, 2025**. There will be a virtual public bid opening at 10:10 a.m. local time held via zoom. **An In-Person Pre-Bid Conference will be held by the District on Thursday, October 23, 2025, 10:00 AM local time**, to provide an opportunity to outline the requirements the District will expect of the Bidder, as well as to provide the opportunity for questions and explanations. **The Pre-Bid Conference will take place in the conference room of the GHTD administrative offices located at One Union Place, First Floor, Hartford, CT 06103**. **The Pre-Bid**

Conference will be immediately followed by an on-site walk-through of the project site located at One Union Place, Hartford, CT, 06103.

Attendance at the Pre-Bid Conference and Site Visit is not mandatory, and is not a condition for final award.

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

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

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

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

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

IFB KEY INFORMATION SUMMARY SHEET

Invitation for Bids:	Roof Drain Line Repair at Hartford Union Station (RE-BID)
Solicitation Number:	IFB #01-026
IFB Issue Date:	October 10, 2025
IFB Issuing Office:	Greater Hartford Transit District
Procurement Officer:	LaShaunda Drake Contract & Procurement Specialist Greater Hartford Transit District One Union Place Hartford, CT 06103 Direct Phone: (860) 380-2012 Email: ldrake@ghtd.org
Proposal to be sent to:	Greater Hartford Transit District One Union Place Hartford, CT 06103 Attn: LaShaunda Drake
In-Person Pre-Bid Conference And On-Site Walk-Through: ***Participation is NOT mandatory***	October 23, 2025 at 10:00 a.m. Local Time Greater Hartford Transit District First Floor One Union Place Hartford, CT 06103
Approved Equals Request Deadline:	November 6, 2025 at 12:00 p.m. Local Time
Inquiries Deadline:	November 6, 2025 at 12:00 p.m. Local Time
Bid Due Date and Time:	November 21, 2025 at 10:00 a.m. Local Time Bid opening promptly at 10:10 a.m. Local Time Web Meeting via Zoom https://us06web.zoom.us/j/82824536141?pwd=H79QBaIVkzAbX1CpWnZO8bwpigejzR.1 Meeting ID: 828 2453 6141 Passcode: 162917 To call in by phone: (929) 205 6099

SECTION I – GENERAL INFORMATION FOR BIDDERS

1. INTRODUCTION

The Greater Hartford Transit District (the "District") is a quasi-municipal corporation operating under the authority of Chapter 103a of the Connecticut General Statutes. There are currently sixteen-member towns represented by appointees who collectively form the Board of Directors, the policy making body of the District. The District has broad powers to acquire, operate, finance, plan, develop, maintain and otherwise provide all forms of land transportation and related services including the development or renewal of transportation centers and parking facilities.

The District is eligible and authorized under state and local law to request, receive, and manage grant funds and to execute and administer grant-funded projects. The District provides a variety of services in support of public transportation in the Capitol Region of Connecticut. The contract awarded as a result of this quote solicitation will be subject to both State of Connecticut and Federal Contract Clauses.

The District is the owner and operator of Hartford's Historic Union Station Transportation Center Complex, an intermodal hub of transportation that currently serves Amtrak rail, CTrail, intercity and intra city bus service, taxi services, and public parking. The Complex includes the Spruce Street Parking Lot. The District is also the owner of the Greater Hartford Transit District ADA Paratransit Operations and Maintenance Facility (the "Facility") located at 148 Roberts Street in East Hartford, CT.

The District, as the owner and operator of the Facility, issues this formal Invitation for Bids (IFB) from a qualified firm or firms for the provision of a licensed contractor to perform necessary repairs of the existing roof drain line system located at the Union Station Transportation Facility Complex (**see Exhibit H for detailed scope of work**). The project location is One Union Place, Hartford, CT 06103. The scope of work for this project is based on, and is expected to be performed in accordance with, the specs and drawings as developed by the assigned Architectural and Engineering firm, Simpson, Gumpertz, & Heger (SGH) Associates, Inc.

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

2. SUBMISSION OF BIDS

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

a) Date and Location for Submittal

Bids must be submitted to the District on or before **Friday, November 21, 2025 at 10:00 a.m. local time**. There will be a virtual public bid opening at 10:10 a.m. local time held via Zoom.

To join the meeting:
https://us06web.zoom.us/j/82824536141?pwd=H79QBaIVkzAbX1CpWnZO8bwpigejzR.1
Meeting ID: 828 2453 6141
Passcode: 162917
To call in by phone: (929) 205 6099

Each bid shall be securely sealed in a suitable envelope and marked "GHTD IFB #09-025 ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION (RE-BID)" in capital letters on the envelope. **Bidders must also include a complete electronic copy (i.e. USB flash drive) of their bid proposal in the envelope**. Bids should be delivered to:

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

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

b) Form of Bid

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

Every designated space on the bid form shall be filled in or otherwise marked to show the bidder's intention clearly. Interlineations, alterations, erasures or any other change must be clearly initialed by the bidder. All amounts shall be stated in figures. The bid form is to be submitted along with the Certifications and other documents required by this IFB. Any conditional or qualified bid will be rejected. **In addition to the bid proposal form (Exhibit D), bidders must also submit a rate sheet for all staff working on the project.**

3. BID INQUIRIES

Communication by any bidder with any agent or employee of the District on the subject of this IFB, or the pending process may result in the bidder being deemed ineligible with regard to this IFB. All questions and requests for clarification regarding this IFB or this process must be submitted in writing to LaShaunda Drake at ldrake@ghtd.org on or before **12:00 p.m. local time on Thursday, November 6, 2025**. Responses shall be in writing and posted in the form of an addendum and will be distributed to all known recipients of the IFB document.

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

4. PRE-BID CONFERENCE & SITE INSPECTION

An In-Person Pre-Bid Conference will be held by the District on Thursday, October 23, 2025, 10:00 AM local time, to provide an opportunity to outline the requirements the District will expect of the Bidder, as well as to provide the opportunity for questions and explanations. The Bidder may submit any written requests for clarification as well as any questions regarding this solicitation package prior to the pre-bid conference. **The Pre-Bid Conference will take place in the conference room of the GHTD administrative offices located at One Union Place, First Floor, Hartford, CT 06103**. **The Pre-Bid Conference will be immediately followed by an on-site walk-through of the project site located at One Union Place, Hartford, CT, 06103**.

Attendance at the Pre-Bid Conference and On-Site Walk-Through is not mandatory, and is not a condition for final award.

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

Information contained in these documents is provided in good faith only that all Proposers may have access to the same information utilized by the District, and is not intended as a substitute for personal investigations, interpretations and judgment of the Proposer.

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

5. COMMENCEMENT OF SERVICES

It is the intent of the District to execute an agreement with the successful bidder, and for work to commence upon execution of contract. Work under this contractual agreement is expected to be completed within **180 days**. The Contractor is expected to immediately communicate with the District any delays experienced which may impede the anticipated project timeline.

6. FUNDING

Any contract resulting from this Invitation for Bids is subject to a financial assistance contract between the District and the Federal Transit Administration and between the District and the State of Connecticut Department of Transportation. All firms will be required to certify that they are not on the U.S. Department of Transportation's list of

ineligible contractors. Further, the contractor will be required to comply with all applicable equal employment opportunity laws and regulations.

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

7. FEDERAL GRANT REQUIREMENTS

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

8. STATE GRANT REQUIREMENTS

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

9. PROCUREMENT AND APPEALS PROCESS

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

10. DISADVANTAGED BUSINESS ENTERPRISE

It is the policy of the District that disadvantaged business enterprises ("DBE's") be afforded the maximum opportunity to participate in the performance of all contracts let by the District. This participation may be in the form of prime contracts, and/or sub-contracts, and/or direct or general overhead items procured from DBEs allocated to the Services. The term "disadvantaged business enterprise" means a business enterprise that is at least 51% owned and controlled by one or more socially disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background, or other similar cause. Such persons would include but not be limited to citizens of the United States who are: African Americans (not of Hispanic origin); Hispanic Americans; Native Americans; Asian-Pacific Americans; and, women regardless of race and ethnicity. Proposers will submit a statement indicating its own DBE status and what subcontracts and/or overhead purchases with amounts thereof under this project it will get to comply with the District's DBE goal of **7.9%.** DBEs must be certified with the CTDOT.

If the Contractor is unable to achieve the specified contract goals, the Contractor must submit written documentation to the District indicating his/her good faith efforts to satisfy goal requirements. The bidder must present information on DBEs proposed to meet the goal as part of bid responsiveness (provided at the time of bid) or no later than five (5) calendar days after bid opening as a matter of responsibility**.** An example of a good faith effort includes whether the contractor provided written notice to a reasonable number of DBEs with potential interest in the contract and with sufficient time to allow participation. It is important to note that DBEs are certified to perform certain types of work. To receive credit for good faith efforts and to count towards goal attainment, named DBEs must be certified to do the scopes of work that they are contacted/contracted to perform.

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

11. VALIDITY OF PROPOSALS

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

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

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

12. INFORMATION TO BIDDERS

(a) Discrepancy in Bid Documents

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

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

(b) Brand Names

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

(c) Requests for Clarification

Requests for clarification of plans or specifications and any protest thereof must be received by the District, in writing, to LaShaunda Drake at ldrake@ghtd.org on or before **12:00 p.m. local time on Thursday, November 6, 2025.** Responses shall be in writing

and posted in the form of an addendum and will be distributed to all known recipients of the IFB document.

Requests for Approved Equal Status

In all cases, materials must be furnished as specified. Where brand names or specific items are used in the plans or specifications, consider the term "or approved equal" to follow.
Any unapproved deviations, exceptions, substitutions, alternates or conditional qualifications contained in a proposal may be cause for its rejection. If contractors believe that their product is an equal to the product specified, they must submit a written request to District in triplicate and this request will be approved or rejected by the District at least fifteen (15) calendar days prior to the scheduled opening of the bids. Requests for approved equals must be received by the District in writing by **12:00 p.m. local time on Thursday, November 6, 2025**.

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

(d) Obligations of the Proposer

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

(e) Omission of Details

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

(f) Qualification of Bidders

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

(f) Determination of Successful Bidder

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

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

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

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

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

(g) Disqualification of Bidders

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

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

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

13. QUANTITIES AND/OR USAGES

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

14. SAMPLES

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

15. PAYMENT OF PREVAILING WAGES/DAVIS BACON WAGE RATES

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

16. BONDING REQUIREMENTS/PERMITTING

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

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

The Contractor is responsible for obtaining all permits for the project, including but not limited permits for demolition, and street opening.

17. SINGLE BIDDER/SOLE SOURCE PROCUREMENT

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

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

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

18. WITHDRAWAL OF BIDS

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

19. SUBCONTRACTING

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

20. CONTRACTING

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

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

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

Contract Documents

The Contract Documents consist of the Contract, this Invitation for Bids (IFB) and its reference documents, drawings, any Addenda issued, the Contractor's response to the IFB, the federal Requirements (Exhibit A), other documents listed in the Contract, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by the parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a Minor change in the Work issued by the Design Professional on behalf of the District.

21. RETAINAGE

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

22. ASSIGNMENT

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

23. REQUIRED CERTIFICATIONS

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

24. INSURANCE REQUIREMENTS

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

A. Commercial General Liability

The Contractor shall carry Commercial General Liability Insurance, including a broad form comprehensive general liability endorsement and coverage against claims for personal injury, bodily injury, death or property damage, to be on the so-called "occurrence" form with a combined limit of not less than Two Million Dollars ($2,000,000) in the aggregate and One Million Dollars ($1,000,000) per occurrence, and to cover at least the following hazards: (1) premises and operations; (2) products and completed operations on an "if any" basis; (3) independent contractors; (4) blanket contractual liability for all insured contracts; and (5) contractual liability covering the indemnities in this Contract.

B. Excess Liability

Excess liability coverage, providing for increased limits to the General Liability, Automobile Liability, and Employers Liability, in the amount of $4M per occurrence/aggregate.

C. Workers' Compensation Insurance

With respect to all services the Contractor performs and all those performed for the Contractor by its subcontractors, the Contractor and its subcontractor(s) shall carry Workers' Compensation Insurance and, as applicable, insurance required in accordance with the U.S. Longshore and Harbor Workers' Compensation Act, in accordance with the requirements of the laws of the State of Connecticut, and of the laws of the United States, respectively. Employers Liability: Each Accident ($1,000,000), Disease: Each Employee ($1,000,000), Disease Policy Limit ($1,000,000).

D. Business Automobile Insurance

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

E. Professional Liability Insurance

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

F. Contractors Pollution Liability Insurance

If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than one million dollars ($1,000,000) per claim and two million dollars ($2,000,000) in the aggregate.

G. Certificate of Insurance

All insurance provided for above shall be obtained under valid and enforceable policies, and issued by financially sound and responsible insurance companies authorized to do business in the State of Connecticut and having a general policy rating of A- or better and a financial class of VIII or better, each as determined by AM Best Company, Inc. Prior to commencing any work under this Contract and at least ten (10) days prior to the expiration dates of any insurance required hereunder, Contractor shall deliver to the District certificates of insurance evidencing such coverage and any renewal or successor policies. If the Contractor engages any subcontractor to perform any of its obligations under this Contract, the Contractor shall also deliver to the District certificates of insurance from such subcontractor evidencing such coverage and any renewal or successor policies. All policies of insurance required hereunder shall name the District (and such other persons or entities designated by the District) as an additional insured (except the workers' compensation and Professional Liability insurance). For the Workers' Compensation Insurance and, as applicable, U.S. Longshore and Harbor Workers' Compensation Act coverage, the policy number(s) and term of the policy(ies) shall be indicated on the certificate. With the exception of Professional Liability Insurance, each insurance policy shall state that the insurance company agrees to investigate and defend the insured against all claims for damages, even if groundless. All insurance policies provided for above shall contain clauses or endorsements to the effect that: (i) no act or negligence of the Contractor, or anyone acting for the Contractor, or failure to comply with the provisions of any policy, which might otherwise result in a forfeiture of the insurance or any part thereof, shall in any way affect the validity or enforceability of the insurance insofar as the District is concerned; (ii) no such policies shall be canceled without at least thirty (30) days' notice to the District (10 days for non-payment of premium); (iii) shall contain a waiver of subrogation in favor of the District, and (iv) shall provide that such coverage is primary and non-contributory.

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

contracting for such required insurance coverage at any time, and in such event the Contractor shall pay the District for all costs of such insurance.

H. Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the District and its officers, directors, employees and agents (collectively "Indemnified Parties") from and against all claims, damages, demands, losses, expenses, fines, penalties, causes of action, suits or other liabilities (including all costs of reasonable attorneys' fees and litigation expenses) arising out of, related to, in connection with or resulting from, or alleged to arise out of or arise from the negligent acts or omissions, breach or failure to perform under the Contract or the violation of any applicable law or regulation, by Contractor, Contractor's subcontractors or anyone directly or indirectly employed by Contractor or by Contractor's subcontractors or anyone for whose acts any of them may be responsible or liable and whether such claim, damage, demand, loss, expense, fine, penalty, cause of action, suit or other liability is attributable to bodily injury, personal injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom. This indemnity shall be effective regardless of whether or not such claim, damage, loss or expense is caused in part by any of the Indemnified Parties (but the indemnity shall not cover liability to the extent resulting from gross negligence or willful misconduct of the Indemnified Parties). Such indemnity obligation shall not be in derogation or limitation of any other obligation or liability of the Contractor or the rights of the District contained in this Contract or otherwise. This indemnification shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor under any workers' compensation acts, disability benefit acts or other employee benefits acts and includes any loss or injury suffered by an employee of Contractor. This indemnification shall survive the completion of the Work or the termination of the Contract. Without limiting the scope of this indemnity, this indemnity shall entitle the District to recover from the Contractor all costs of reasonable attorneys' fees and litigation expenses incurred by the District in any dispute, including but not limited to any dispute between the District and the Contractor, that is within the scope of this indemnity.

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

25. NOTICE OF AWARD

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

26. ATTACHED EXHIBITS

The following attachments are included in this package:

EXHIBIT A

- Federally Required Contract Clauses

EXHIBIT B

- State of Connecticut Grant Requirements

EXHIBIT C

- Procurement Procedures and Appeals Process

EXHIBIT D

- Bid Proposal Form **(<u>Bidders must also include a rate sheet for all staff working on the project</u>)**

EXHIBIT E

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

EXHIBIT F

- State of Connecticut Contract Requirements

EXHIBIT G

- Connecticut Department of Labor Prevailing Wage Bid Package

EXHIBIT H

- Technical Specifications and Special Provisions

EXHIBIT A
FEDERALLY REQUIRED CONTRACT CLAUSES

FEDERALLY REQUIRED CONTRACT CLAUSES

Access to Records and Reports –

a. Record Retention. The Contractor will retain, and will require its subcontractors of all tiers to retain, complete and readily accessible records related in whole or in part to the contract, including, but not limited to, data, documents, reports, statistics, leases, subcontracts, arrangements, other third-party Contracts of any type, and supporting materials related to those records.
b. Retention Period. The Contractor agrees to comply with the record retention requirements
in accordance with 2 C.F.R. § 200.334. The Contractor shall maintain all books, records, accounts and reports required under this Contract for a period of at not less than three (3) years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case records shall be maintained until the disposition of all such litigation, appeals, claims or exceptions related thereto.
c. Access to Records. The Contractor agrees to provide sufficient access to FTA and its contractors to inspect and audit records and information related to performance of this contract in accordance with 2 CFR § 200.337.
d. Access to the Sites of Performance. The Contractor agrees to permit FTA and its contractors' access to the sites of performance under this contract in accordance with 2 CFR § 200.337.

Americans with Disabilities Act (ADA) –

The contractor agrees to comply with all applicable requirements of section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps, with the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. §§ 12101 et seq., which requires that accessible facilities and services be made available to persons with disabilities, including any subsequent amendments to that Act, and with the Architectural Barriers act of 1968, as amended, 42 U.S.C. §§ 4151 et seq., which requires that buildings and public accommodations be accessible to persons with disabilities, including any subsequent amendments to that Act. In addition, the contractor agrees to comply with any and all applicable requirements issued by the FTA, DOT, DOJ, U.S. GSA, U.S. EEOC, U.S. FCC, any subsequent amendments thereto and any other nondiscrimination statute(s) that may apply to the Project.

Bond Requirements –

For construction or facility improvement contracts or subcontracts exceeding the Simplified Acquisition Threshold, the Federal awarding agency or pass-through entity may accept the bonding policy and requirements of the non-Federal entity provided that the Federal awarding agency or pass-through entity has made a determination that the Federal interest is adequately protected. If such a determination has not been made, the minimum requirements must be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon

acceptance of the bid, execute such contractual documents as may be required within the time specified.

(b) A performance bond on the part of the contractor for 100 percent of the contract price. A “performance bond” is one executed in connection with a contract to secure fulfillment of all the contractor's requirements under such contract.

(c) A payment bond on the part of the contractor for 100 percent of the contract price. A “payment bond” is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

It is also understood and agreed that if the bidder should withdraw any part or all of their bid within [90] days after the bid opening without the written consent of the Agency, or refuse or be unable to enter into this Contract as provided above, or refuse or be unable to furnish adequate and acceptable Performance and Payment Bonds, or refuse or be unable to furnish adequate and acceptable insurance, as provided above, it shall forfeit its bid guaranty to the extent Agency’s damages occasioned by such withdrawal, or refusal, or inability to enter into a Contract, or provide adequate security thereof.

It is further understood and agreed that to the extent the defaulting bidder's bid guaranty shall
prove inadequate to fully recompense Agency for the damages occasioned by default, then the bidder agrees to indemnify Agency and pay over to Agency the difference between the bid guarantee and Agency’s total damages so as to make Agency whole.

The bidder understands that any material alteration of any of the above or any of the material contained herein, other than that requested will render the bid unresponsive.

Performance Guarantee. A Performance Guarantee in the amount of 100% of the Contract value is required by the Agency to ensure faithful performance of the Contract. Either a Performance Bond or an Irrevocable Stand-By Letter of Credit shall be provided by the Contractor and shall remain in full force for the term of the Contract. The successful Bidder shall certify that it will provide the requisite Performance Guarantee to the Agency within ten (10) business days from Contract execution. The Agency requires all Performance Bonds to be provided by a fully qualified surety company acceptable to the Agency and listed as a company currently authorized under 31 C.F.R. part 22 as possessing a Certificate of Authority as described hereunder. Agency may require additional performance bond protection when the contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price. The Agency may secure additional protection by directing the Contractor to increase the amount of the existing bond or to obtain an additional bond.

If the Bidder chooses to provide a Letter of Credit as its Performance Guarantee, the Bidder shall furnish with its bid, certification that an Irrevocable Stand-By Letter of Credit will be furnished should the Bidder become the successful Contractor. The Bidder shall also provide a statement from the banking institution certifying that an Irrevocable Stand-By Letter of Credit for the action will be provided if the Contract is awarded to the Bidder. The Irrevocable Stand-By Letter of Credit will only be accepted by the Agency if:

1. A bank in good standing issues it. The Agency will not accept a Letter of Credit from an entity other than a bank.
2. It is in writing and signed by the issuing bank.
3. It conspicuously states that it is an irrevocable, non-transferable, "standby" Letter of Credit.
4. The Agency is identified as the Beneficiary.
5. It is in an amount equal to 100% of the Contract value. This amount must be in U.S. dollars.
6. The effective date of the Letter of Credit is the same as the effective date of the Contract
7. The expiration date of the Letter of Credit coincides with the term of the contract.
8. It indicates that it is being issued in order to support the obligation of the Contractor to perform under the Contract. It must specifically reference the Contract between the Agency and the Contractor the work stipulated herein.

The issuing bank's obligation to pay will arise upon the presentation of the original Letter of
Credit and a certificate and draft to the issuing bank's representative at a location and time to be determined by the parties. This documentation will indicate that the Contractor is in default under the Contract.

Payment Bonds. A Labor and Materials Payment Bond equal to the full value of the contract must be furnished by the contractor to Agency as security for payment by the Contractor and subcontractors for labor, materials, and rental of equipment. The bond may be issued by a fully qualified surety company acceptable to (Agency) and listed as a company currently authorized under 31 C.F.R. part 223 as possessing a Certificate of Authority as described thereunder.

Buy America –
The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 C.F.R. part 661 and 2 CFR § 200.322 Domestic preferences for procurements, which provide that Federal funds may not be obligated unless all steel, iron, and manufactured products used in FTA funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 C.F.R. § 661.7.

Construction materials used in the Project are subject to the domestic preference requirement of the Build America, Buy America Act, Pub. L. 117-58, div. G, tit. IX, §§ 70911 – 70927 (2021), as implemented by the U.S. Office of Management and Budget, the U.S. Department of Transportation, and FTA. The Recipient acknowledges that this agreement is neither a waiver of § 70914(a) nor a finding under § 70914(b).

Separate requirements for rolling stock are set out at 49 U.S.C. 5323(j)(2)(C), 49 U.S.C. § 5323(u) and 49 C.F.R. § 661.11. Domestic preferences for procurements.

The bidder or offeror must submit to the Agency the appropriate Buy America certification. Bids or offers that are not accompanied by a completed Buy America certification will be rejected as nonresponsive. For more information, please see the FTA's Buy America webpage at: https://www.transit.dot.gov/buyamerica.

Cargo Preference Requirements –

The contractor agrees:
a. to use privately owned United States-Flag commercial vessels to ship at least 50 percent
of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels;

b. to furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for
shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA Recipient (through the contractor in the case of a subcontractor's bill-of-lading.); and

c. to include these requirements in all subcontracts issued pursuant to this contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

Civil Rights Laws and Regulations –

The following Federal Civil Rights laws and regulations apply to all contracts.
1 **Federal Equal Employment Opportunity (EEO) Requirements**. These include, but are not limited to:
a) Nondiscrimination in Federal Public Transportation Programs. 49 U.S.C. § 5332, covering projects, programs, and activities financed under 49 U.S.C. Chapter 53, prohibits discrimination on the basis of race, color, religion, national origin, sex (including sexual orientation and gender identity), disability, or age, and prohibits discrimination in employment or business opportunity.

b) Prohibition against Employment Discrimination. Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000e, and Executive Order No. 11246, “Equal Employment Opportunity,” September 24, 1965, as amended, prohibit discrimination in employment on the basis of race, color, religion, sex, or national origin.

2 **Nondiscrimination on the Basis of Sex.** Title IX of the Education Amendments of 1972, as amended, 20 U.S.C. § 1681 et seq. and implementing Federal regulations, “Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance,” 49 C.F.R. part 25 prohibit discrimination on the basis of sex.

3 **Nondiscrimination on the Basis of Age**. The “Age Discrimination Act of 1975,” as amended, 42 U.S.C. § 6101 et seq., and Department of Health and Human Services implementing regulations, “Nondiscrimination on the Basis of Age in Programs or

Activities Receiving Federal Financial Assistance," 45 C.F.R. part 90, prohibit discrimination by participants in federally assisted programs against individuals on the basis of age. The Age Discrimination in Employment Act (ADEA), 29 U.S.C. § 621 et seq., and Equal Employment Opportunity Commission (EEOC) implementing regulations, "Age Discrimination in Employment Act," 29 C.F.R. part 1625, also prohibit employment discrimination against individuals age 40 and over on the basis of age.

4 **Federal Protections for Individuals with Disabilities**. The Americans with Disabilities Act of 1990, as amended (ADA), 42 U.S.C. § 12101 et seq., prohibits discrimination against qualified individuals with disabilities in programs, activities, and services, and imposes specific requirements on public and private entities. Third party contractors must comply with their responsibilities under Titles I, II, III, IV, and V of the ADA in employment, public services, public accommodations, telecommunications, and other provisions, many of which are subject to regulations issued by other Federal agencies.

Civil Rights and Equal Opportunity

The Agency is an Equal Opportunity Employer. As such, the Agency agrees to comply with all applicable Federal civil rights laws and implementing regulations. Apart from inconsistent requirements imposed by Federal laws or regulations, the Agency agrees to comply with the requirements of 49 U.S.C. § 5323(h) (3) by not using any Federal assistance
awarded by FTA to support procurements using exclusionary or discriminatory specifications.
Under this Contract, the Contractor shall at all times comply with the following requirements and shall include these requirements in each subcontract entered into as part
thereof.

1. **Nondiscrimination**. In accordance with Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, disability, or age. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

2. **Race, Color, Religion, National Origin, Sex**. In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e et seq., and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. chapter 60, and Executive Order No. 11246, "Equal Employment Opportunity in Federal Employment," September 24, 1965, 42 U.S.C. § 2000e note, as amended by any later Executive Order that amends or supersedes it, referenced in 42 U.S.C. § 2000e note. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, national origin, or sex (including sexual orientation and gender identity). Such action shall include, but not be limited to, the following: employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for

training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3. **Age**. In accordance with the Age Discrimination in Employment Act, 29 U.S.C. §§ 621-634, U.S. Equal Employment Opportunity Commission (U.S. EEOC) regulations, "Age Discrimination in Employment Act," 29 C.F.R. part 1625, the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6101 et seq., U.S. Health and Human Services regulations, "Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance," 45 C.F.R. part 90, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any Implementing requirements FTA may issue.

4. **Disabilities**. In accordance with section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, the Americans with Disabilities Act of 1990, as amended, 42 U.S.C. § 12101 et seq., the Architectural Barriers Act of 1968, as amended, 42 U.S.C. § 4151 et seq., and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against individuals on the basis of disability. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

5. **Promoting Free Speech and Religious Liberty**. The Contractor shall ensure that Federal funding is expended in full accordance with the U.S. Constitution, Federal Law, and statutory and public policy requirements: including, but not limited to, those protecting free speech, religious liberty, public welfare, the environment, and prohibiting discrimination.

Clean Air Act and Federal Water Pollution Control Act –

The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. § 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). Violations must be reported to FTA and the Regional Office of the Environmental Protection Agency. The following applies for contracts of amounts in excess of $150,000:

Clean Air Act

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

(2) The contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to assure notification to the Agency, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FTA.

Federal Water Pollution Control Act

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

(2) The contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to assure notification to the Agency, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FTA."

Contract Work Hours and Safety Standards Act –

a. Applicability: This requirement applies to all FTA grant and cooperative agreement programs.

b. Where applicable (see 40 U.S.C. § 3701), all contracts awarded by the non-Federal entity in excess of $100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5. See 2 C.F.R. Part 200, Appendix II.

c. Under 40 U.S.C. § 3702, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week.

d. The requirements of 40 U.S.C. § 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

e. The regulation at 29 C.F.R. § 5.5(b) provides the required contract clause concerning compliance with the Contract Work Hours and Safety Standards Act:

Compliance with the Contract Work Hours and Safety Standards Act.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate

not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

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

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section."

Davis Bacon Act and Copeland Anti-Kickback Act –

For all prime construction, alteration or repair contracts in excess of $2,000 awarded by FTA, the Contractor shall comply with the Davis-Bacon Act and the Copeland "Anti-Kickback" Act. Under 49 U.S.C. § 5333(a), prevailing wage protections apply to laborers and mechanics employed on FTA assisted construction, alteration, or repair projects. The Contractor will comply with the Davis-Bacon Act, 40 U.S.C. §§ 3141-3144, and 3146-3148 as supplemented by DOL regulations at 29 C.F.R. part 5, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction." In accordance with the statute, the Contractor shall pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, the Contractor agrees to pay wages not less than once a week. The Contractor shall also comply with the Copeland "Anti-Kickback" Act (40 U.S.C. § 3145), as supplemented by DOL regulations at 29 C.F.R. part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in part by Loans or Grants from the United States." The Contractor is prohibited from inducing, by any means, any person employed in the construction,

completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

Debarment and Suspension–

The Contractor shall comply and facilitate compliance with U.S. DOT regulations, "Nonprocurement Suspension and Debarment," 2 C.F.R. part 1200, which adopts and supplements the U.S. Office of Management and Budget (U.S. OMB) "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 C.F.R. part 180. These provisions apply to each contract at any tier of $25,000 or more, and to each contract at any tier for a federally required audit (irrespective of the contract amount), and to each contract at any tier that must be approved by an FTA official irrespective of the contract amount. As such, the Contractor shall verify that its principals, affiliates, and subcontractors are eligible to participate in this federally funded contract and are not presently declared by any Federal department or agency to be:

a) Debarred from participation in any federally assisted Award;
b) Suspended from participation in any federally assisted Award;
c) Proposed for debarment from participation in any federally assisted Award;
d) Declared ineligible to participate in any federally assisted Award;
e) Voluntarily excluded from participation in any federally assisted Award; or
f) Disqualified from participation in ay federally assisted Award.

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows: The certification in this clause is a material representation of fact relied upon by the AGENCY. If it is later determined by the AGENCY that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to the AGENCY, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. part 180, subpart C, as supplemented by 2 C.F.R. part 1200, while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Disadvantaged Business Enterprises -–

(Does not apply to projects fully funded by the Tribal Transportation Program (TTP).)

It is the policy of the Agency and the United States Department of Transportation ("DOT") that Disadvantaged Business Enterprises ("DBE's"), as defined herein and in the Federal regulations published at 49 C.F.R. part 26, shall have an equal opportunity to participate in DOT-assisted contracts.

The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 C.F.R. part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Agency deems appropriate, which may include, but is not limited to:

(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or

(4) Disqualifying the contractor from future bidding as non-responsible. 49 C.F.R. § 26.13(b).

Prime contractors are required to pay subcontractors for satisfactory performance of their contracts no later than 30 days from receipt of each payment the Agency makes to the prime contractor. 49 C.F.R. § 26.29(a).

Finally, for contracts with defined DBE contract goals, each FTA Recipient must include in each prime contract a provision stating that the contractor shall utilize the specific DBEs listed unless the contractor obtains the Agency's written consent; and that, unless the Agency's consent is provided, the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE. 49 C.F.R. § 26.53(f) (1).

Energy Conservation –

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C.§ 6201).

Equal Employment Opportunity–

During the performance of this contract, the contractor agrees as follows:
(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
(4) The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be

provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
(7) In the event of the contractor's non-compliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
(8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

Notice to Third Party Participants –

Federal requirements that apply to the Recipient or the Award, the accompanying Underlying Agreement, and any Amendments thereto may change due to changes in federal law, regulation, other requirements, or guidance, or changes in the Recipient's Underlying Agreement including any information incorporated by reference and made part of that Underlying Agreement; and Applicable changes to those federal requirements will apply to each Third-Party Agreement and parties thereto at any tier.

Federal Changes

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

Federal Tax Liability and Recent Felony Convictions –

(1) The contractor certifies that it:

(a) Does not have any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability; and

(b) Was not convicted of the felony criminal violation under any Federal law within the preceding 24 months.

If the contractor cannot so certify, the Recipient will refer the matter to FTA and not enter into any Third-Party Agreement with the Third-Party Participant without FTA's written approval.

(2) Flow-Down. The Recipient agrees to require the contractor to flow this requirement down to participants at all lower tiers, without regard to the value of any subagreement.

Fly America Requirements –

a) Definitions. As used in this clause—

1) "International air transportation" means transportation by air between a place in the United States and a place outside the United States or between two places both of which are outside the United States.
2) "United States" means the 50 States, the District of Columbia, and outlying areas.
3) "U.S.-flag air carrier" means an air carrier holding a certificate under 49 U.S.C. Chapter 411.

b) When Federal funds are used to fund travel, Section 5 of the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) (Fly America Act) requires contractors, Agency's, and others use U.S.-flag air carriers for U.S. Government-financed international air transportation of personnel (and their personal effects) or property, to the extent that service by those carriers is available. It requires the Comptroller General of the United States, in the absence of satisfactory proof of the necessity for foreign-flag air transportation, to disallow expenditures from funds, appropriated or otherwise established for the account of the United States, for international air transportation secured aboard a foreign-flag air carrier if a U.S.-flag air carrier is available to provide such services.

c) If available, the Contractor, in performing work under this contract, shall use U.S.-flag carriers for international air transportation of personnel (and their personal effects) or property.

d) In the event that the Contractor selects a carrier other than a U.S.-flag air carrier for international air transportation, the Contractor shall include a statement on vouchers involving such transportation essentially as follows:

Statement of Unavailability of U.S.-Flag Air Carriers
International air transportation of persons (and their personal effects) or property by U.S.-flag air carrier was not available or it was necessary to use foreign-flag air carrier service for the following reasons. See FAR § 47.403. [State reasons]:

e) Contractor shall include the substance of this clause, including this paragraph (e), in each subcontract or purchase under this contract that may involve international air transportation.

Incorporation of Federal Transit Administration (FTA) Terms –

The provisions within include, in part, certain Standard Terms and Conditions required under the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR § 200), whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, detailed in 2 CFR § 200 or as amended by 2 CFR § 1201, or the most recent version of FTA Circular 4220.1 are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any request which would cause a violation of the FTA terms and conditions.

No Government Obligation to Third Parties –

The Recipient and Contractor acknowledge and agree that, notwithstanding any concurrence by
the Federal Government in or approval of the solicitation or award of the underlying Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to the Recipient, Contractor or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying Contract. The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by the FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

Notification to FTA –

If a current or prospective legal matter that may affect the Federal Government emerges, the Recipient must promptly notify the FTA Chief Counsel and FTA Regional Counsel for the Region in which the Recipient is located. The Recipient must include a similar notification requirement in its Third-Party Agreements and must require each Third Party Participant to include an equivalent provision in its subagreements at every tier, for any agreement that is a “covered transaction” according to 2 C.F.R. §§ 180.220 and 1200.220.

(1) The types of legal matters that require notification include, but are not limited to, a major dispute, breach, default, litigation, or naming the Federal Government as a party to litigation or a legal disagreement in any forum for any reason.

(2) Matters that may affect the Federal Government include, but are not limited to, the Federal Government’s interests in the Award, the accompanying Underlying Agreement, and any Amendments thereto, or the Federal Government’s administration or enforcement of federal laws, regulations, and requirements.

(3) The Recipient must promptly notify the U.S. DOT Inspector General in addition to the FTA Chief Counsel or Regional Counsel for the Region in which the Recipient is located, if the Recipient has knowledge of potential fraud, waste, or abuse occurring on a Project receiving assistance from FTA. The notification provision applies if a person has or may have submitted a false claim under the False Claims Act, 31 U.S.C. § 3729 et seq., or has or may have committed a criminal or civil violation of law pertaining to such matters as fraud, conflict of interest, bribery, gratuity, or similar misconduct. This responsibility occurs whether the Project is subject to this Agreement or another agreement between the Recipient and FTA, or an agreement involving a principal, officer, employee, agent, or Third-Party Participant of the Recipient. It also applies to subcontractors at any tier. Knowledge, as used in this paragraph, includes, but is not limited to, knowledge of a criminal or civil investigation by a Federal, state, or local law enforcement or other investigative agency, a criminal indictment or civil complaint, or probable cause that could support a criminal indictment, or any other credible information in the possession of the Recipient.

Program Fraud and False or Fraudulent Statements and Related Acts –

The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. chapter 53, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5323(l) on the Contractor, to the extent the Federal Government deems appropriate.

The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment –

a) Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

1) Procure or obtain;

2) Extend or renew a contract to procure or obtain; or

3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

b) In implementing the prohibition under Public Law 115-232, section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

c) See Public Law 115-232, section 889 for additional information.

d) See also § 200.471.

Prompt Payment –

(Does not apply to projects fully funded by the Tribal Transportation Program (TTP).)

The contractor is required to pay its subcontractors performing work related to this contract for satisfactory performance of that work no later than 30 days after the contractor's receipt of payment for that work. In addition, the contractor is required to return any retainage payments to those subcontractors within 30 days after the subcontractor's work related to this contract is satisfactorily completed.

The contractor must promptly notify the Agency, whenever a DBE subcontractor performing work related to this contract is terminated or fails to complete its work and must make good faith efforts to engage another DBE subcontractor to perform at least

the same amount of work. The contractor may not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of the Agency.

Restrictions on Lobbying –

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

Conditions on use of funds.
(a) No appropriated funds may be expended by the recipient of a Federal contract, grant, loan, or cooperative agreement to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) Each person who requests or receives from an agency a Federal contract, grant, loan, or cooperative agreement shall file with that agency a certification, that the person has not made, and will not make, any payment prohibited by paragraph (a) of this section.
(c) Each person who requests or receives from an agency a Federal contract, grant, loan, or a cooperative agreement shall file with that agency a disclosure form if such person has made or has agreed to make any payment using non-appropriated funds (to include profits from any covered Federal action), which would be prohibited under paragraph (a) of this section if paid for with appropriated funds.
(d) Each person who requests or receives from an agency a commitment providing for the United States to insure or guarantee a loan shall file with that agency a statement, whether that person has made or has agreed to make any payment to influence or attempt to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with that loan insurance or guarantee.
(e) Each person who requests or receives from an agency a commitment providing for the United States to insure or guarantee a loan shall file with that agency a disclosure form if that person has made or has agreed to make any payment to influence or attempt to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with that loan insurance or guarantee.

Certification and disclosure.

(a) Each person shall file a certification, and a disclosure form, if required, with each submission that initiates agency consideration of such person for:

(1) Award of a Federal contract, grant, or cooperative agreement exceeding $100,000; or

(2) An award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

(b) Each person shall file a certification, and a disclosure form, if required, upon receipt by such person of:

(1) A Federal contract, grant, or cooperative agreement exceeding $100,000; or

(2) A Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000,

Unless such person previously filed a certification, and a disclosure form, if required, under paragraph (a) of this section.

(c) Each person shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under paragraphs (a) or (b) of this section. An event that materially affects the accuracy of the information reported includes:

(1) A cumulative increase of $25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(d) Any person who requests or receives from a person referred to in paragraphs (a) or (b) of this section:

(1) A subcontract exceeding $100,000 at any tier under a Federal contract;

(2) A subgrant, contract, or subcontract exceeding $100,000 at any tier under a Federal grant;

(3) A contract or subcontract exceeding $100,000 at any tier under a Federal loan exceeding $150,000; or,

(4) A contract or subcontract exceeding $100,000 at any tier under a Federal cooperative agreement,

Shall file a certification, and a disclosure form, if required, to the next tier above.

(e) All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the person referred to in paragraphs (a) or (b) of this section. That person shall forward all disclosure forms to the agency.

(f) Any certification or disclosure form filed under paragraph (e) of this section shall be treated as a material representation of fact upon which all receiving tiers shall rely. All liability arising from an erroneous representation shall be borne solely by the tier filing that representation and shall not be shared by any tier to which the erroneous representation is forwarded. Submitting an erroneous certification or disclosure constitutes a failure to file the required certification or disclosure, respectively. If a person fails to file a required certification or disclosure, the United States may pursue all available remedies, including those authorized by section 1352, title 31, U.S. Code.

(g) For awards and commitments in process prior to December 23, 1989, but not made before that date, certifications shall be required at award or commitment, covering activities occurring between December 23, 1989, and the date of award or commitment. However, for awards and commitments in process prior to the December 23, 1989

effective date of these provisions, but not made before December 23, 1989, disclosure forms shall not be required at time of award or commitment but shall be filed within 30 days.
(h) No reporting is required for an activity paid for with appropriated funds if that activity is allowable under either subpart B or C.

Safe Operation of Motor Vehicles –

Seat Belt Use
The Contractor is encouraged to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company-owned vehicles, company rented vehicles, or personally operated vehicles. The terms "company-owned" and "company-leased" refer to vehicles owned or leased either by the Contractor or Agency.

Distracted Driving
The Contractor agrees to adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers, including policies to ban text messaging while using an electronic device supplied by an employer, and driving a vehicle the driver owns or rents, a vehicle Contactor owns, leases, or rents, or a privately-owned vehicle when on official business in connection with the work performed under this Contract.

Seismic Safety –

The contractor agrees that any new building or addition to an existing building will be designed
and constructed in accordance with the standards for Seismic Safety required in Department of
Transportation (DOT) Seismic Safety Regulations 49 C.F.R. part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract, including work performed by a subcontractor, is in compliance with the standards required by the Seismic Safety regulations and the certification of compliance issued on the project.

Severability –

The Contractor agrees that if any provision of this agreement or any amendment thereto is determined to be invalid, then the remaining provisions thereof that conform to federal laws, regulations, requirements, and guidance will continue in effect.

Simplified Acquisition Threshold –

Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. § 1908, or otherwise set by law, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate. (Note that the simplified acquisition threshold determines the procurement procedures that must be employed pursuant to 2 C.F.R. §§ 200.317–200.327. The simplified acquisition threshold does not exempt a procurement from other eligibility or processes requirements that may apply. For example, Buy

America's eligibility and process requirements apply to any procurement in excess of $150,000. 49 U.S.C. § 5323(j)(13).)

Solid Wastes –

A Recipient that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Special DOL EEO Clause –

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another

employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local

government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

Special Notification Requirements for States –

Applies to States –

a. To the extent required under federal law, the State, as the Recipient, agrees to provide the following information about federal assistance awarded for its State Program, Project, or related activities:

(1) The Identification of FTA as the federal agency providing the federal assistance for a State Program or Project;

(2) The Catalog of Federal Domestic Assistance Number of the program from which the federal assistance for a State Program or Project is authorized; and

(3) The amount of federal assistance FTA has provided for a State Program or Project.

b. Documents - The State agrees to provide the information required under this provision in the following documents: (1) applications for federal assistance, (2) requests for proposals or solicitations, (3) forms, (4) notifications, (5) press releases, and (6) other publications.

Termination –

Termination for Convenience (General Provision)
The Agency may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Agency's best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination.

The Contractor shall promptly submit its termination claim to Agency to be paid the Contractor. If the Contractor has any property in its possession belonging to Agency, the Contractor will account for the same, and dispose of it in the manner Agency directs.

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

Opportunity to Cure (General Provision)
The Agency, in its sole discretion may, in the case of a termination for breach or default, allow the Contractor [an appropriately short period of time] in which to cure the defect. In such case, the Notice of Termination will state the time period in which cure is permitted and other appropriate conditions

If Contractor fails to remedy to Agency's satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within [10 days] after receipt by Contractor of written notice from Agency setting forth the nature of said breach or default, Agency shall have the right to terminate the contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude Agency from also pursuing all available remedies against Contractor and its sureties for said breach or default.

Waiver of Remedies for any Breach
In the event that Agency elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this contract, such waiver by Agency shall not limit Agency's remedies for any succeeding breach of that or of any other covenant, term, or condition of this contract.

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

Termination for Default (Supplies and Service)

If the Contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension, or if the Contractor fails to comply with any other provisions of this contract, the Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Agency.

Termination for Default (Transportation Services)
If the Contractor fails to pick up the commodities or to perform the services, including delivery services, within the time specified in this contract or any extension, or if the Contractor fails to comply with any other provisions of this contract, the Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of default. The Contractor will only be paid the contract price for services performed in accordance with the manner of performance set forth in this contract.

If this contract is terminated while the Contractor has possession of Agency goods, the Contractor shall, upon direction of the Agency, protect and preserve the goods until surrendered to the Agency or its agent. The Contractor and Agency shall agree on payment for the preservation and protection of goods. Failure to agree on an amount will be resolved under the Dispute clause.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Agency.

Termination for Default (Construction)
If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will ensure its completion within the time specified in this contract or any extension or fails to complete the work within this time, or if the Contractor fails to comply with any other provision of this contract, Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. In this event, the Agency may take over the work and compete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Agency resulting from the Contractor's refusal or failure to complete the work within specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Agency in completing the work.

The Contractor's right to proceed shall not be terminated nor shall the Contractor be charged with damages under this clause if:
1. The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include: acts of God, acts of Agency, acts of another contractor in the performance of a contract with Agency, epidemics, quarantine restrictions, strikes, freight embargoes; and
2. The Contractor, within [10] days from the beginning of any delay, notifies Agency in writing of the causes of delay. If, in the judgment of Agency, the delay is excusable, the time for completing the work shall be extended. The judgment of Agency shall be final and conclusive for the parties, but subject to appeal under the Disputes clause(s) of this contract.
3. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of Agency.

Termination for Convenience or Default (Architect and Engineering)
The Agency may terminate this contract in whole or in part, for the Agency’s convenience or because of the failure of the Contractor to fulfill the contract obligations. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the Agency‘s Contracting Officer all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process. Agency has a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or

otherwise use, all such data, drawings, specifications, reports, estimates, summaries, and other information and materials.

If the termination is for the convenience of the Agency, the Agency's Contracting Officer shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services.

If the termination is for failure of the Contractor to fulfill the contract obligations, the Agency may complete the work by contact or otherwise and the Contractor shall be liable for any additional cost incurred by the Agency.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of Agency.

Termination for Convenience or Default (Cost-Type Contracts)
The Agency may terminate this contract, or any portion of it, by serving a Notice of Termination on the Contractor. The notice shall state whether the termination is for convenience of Agency or for the default of the Contractor. If the termination is for default, the notice shall state the manner in which the Contractor has failed to perform the requirements of the contract. The Contractor shall account for any property in its possession paid for from funds received from the Agency, or property supplied to the Contractor by the Agency. If the termination is for default, the Agency may fix the fee, if the contract provides for a fee, to be paid the Contractor in proportion to the value, if any, of work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the Agency and the parties shall negotiate the termination settlement to be paid the Contractor.

If the termination is for the convenience of Agency, the Contractor shall be paid its contract close-out costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination.

If, after serving a Notice of Termination for Default, the Agency determines that the Contractor has an excusable reason for not performing, the Agency, after setting up a new work schedule, may allow the Contractor to continue work, or treat the termination as a Termination for Convenience.

Tracking In Persons –

The contractor agrees that it and its employees that participate in the Recipient's Award, may not:

(a) Engage in severe forms of trafficking in persons during the period of time that the Recipient's Award is in effect;

(b) Procure a commercial sex act during the period of time that the Recipient's Award is in effect; or

(c) Use forced labor in the performance of the Recipient's Award or subagreements thereunder.

Veterans Hiring Preference –

Veterans Employment - Recipients and subrecipients of Federal financial assistance shall ensure that contractors working on a capital project funded using such assistance give a hiring preference, to the extent practicable, to veterans (as defined in section 2108 of title 5) who have the requisite skills and abilities to perform the construction work required under the contract. This subsection shall not be understood, construed or enforced in any manner that would require an employer to give a preference to any veteran over any equally qualified applicant who is a member of any racial or ethnic minority, female, an individual with a disability, or a former employee.

Violation and Breach of Contract –

Disputes:
Disputes arising in the performance of this Contract that are not resolved by agreement of the parties shall be decided in writing by the authorized representative of the agency. This decision shall be final and conclusive unless within [10] days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the agencies authorized representative. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the agencies authorized representative shall be binding upon the Contractor and the Contractor shall abide be the decision.

Performance During Dispute:
Unless otherwise directed by the agencies authorized representative, contractor shall continue performance under this contract while matters in dispute are being resolved.

Claims for Damages:
Should either party to the contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefore shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

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

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

***ADDITIONAL FTA PROCUREMENT PROVISIONS*–**

Geographic Preference: The Greater Hartford Transit District will conduct procurements in a manner that does not give in-State or local geographic preferences in the evaluation of bids or proposals, except in those cases where applicable Federal or State statutes expressly mandate or encourage geographic preference. This does not preempt Connecticut licensing laws from being considered in those disciplines that are regulated by the State. This is in accordance with FTA Circular 4220.1F, Third Party Contracting Guidance.

Cost Plus a Percentage of Cost: The Greater Hartford Transit District strictly prohibits the use of cost plus a percentage of cost based contracts in accordance with FTA Circular 4220.1F., as the Common Grant Rules states that this method of contracting is strictly prohibited.

EXHIBIT B
STATE OF CONNECTICUT
GRANT REQUIREMENTS

STATE OF CONNECTICUT GRANT REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

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

EXECUTIVE ORDERS

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

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

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

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

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

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

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

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

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

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

PROVISIONS DATED MARCH 6, 1998
"SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES"

1. General

   A. Equal employment Opportunity Requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246, Executive Order 11375, the Railroad Revitalization and Regulatory Reform Act of 1976 and other U.S. Department of Transportation nondiscrimination legislation are set forth in this Required Contract/Agreement Provision. The requirements set forth in these special provisions shall constitute the specific affirmative action requirements for project activities under this contract (or agreement) and supplement the equal employment opportunity requirements set forth in other related contract provisions.

   B. "Company" refers to any entity doing business with the Connecticut Department of Transportation and includes but is not limited to the following:

Contractors	Vendors (where applicable)
Subcontractors	Suppliers of Materials (where applicable)
Consultants	Municipalities (where applicable)
Subconsultants	Utilities (where applicable)

   C. The Company will work with the Connecticut Department of Transportation and the federal government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract or agreement.

   E. The Company and all their subcontractors or subconsultants holding subcontracts or subagreements of $10,000 or more on federally assisted projects and $5,000 or more on state funded projects, will comply with the following minimum specific requirement activities of equal employment opportunity. The Company will physically include these requirements in every subcontract or subagreement meeting the monetary criteria above with such modification or language as is necessary to make them binding on the subcontractor or subconsultant.

   F. These Required Contract Provisions apply to all state funded and/or federally assisted projects. activities and programs in all facets of the Connecticut Department of Transportation operations resulting in contracts or agreements.

2. Equal Employment Opportunity Policy

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

3. Equal Employment Opportunity Officer

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

4. Dissemination of Policy

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

(1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less than once every six (6) months thereafter, at which time the Company's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable Company Official.

(2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable Company official covering all major aspects of the Company's equal employment opportunity obligations within thirty (30) days following their reporting for duty with the Company.

(3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate Company official in the Company's procedures for locating and hiring protected class group employees.

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

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

5. Recruitment

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

B. The Company will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the Company will, through its EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the Company for employment consideration.

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

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

6. Personnel Actions

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

A. The Company will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

B. The Company will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practice.

C. The Company will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the Company will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective actions shall include all affected persons.

D. The Company will promptly investigate all complaints of alleged discrimination made to the Company in connection with his obligations under this contract, will

attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Company will inform every complainant of all of his avenues of appeal.

E. The general contact provision entitled A(76) Affirmative Action Requirements is made part of this document by reference. In conjunction with this contract provision, only the job categories will change in order to be comparable with the job categories utilized by the Company proposing to do business with the Connecticut Department of Transportation. The goals and timetables will remain the same throughout the contract provision.

7. Training and Promotion

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

B. Consistent with the Company's work force requirements and as permissible under Federal and State regulations, the Company shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contact performance. Where feasible, 25 percent of apprentices of trainees in each occupation shall be in their first year of apprenticeship of training. In the event the Training Special Provision is provided under this contract, this subparagraph will be superseded.

C. The Company will advise employees and applicants for employment of available training programs and entrance requirements for each.

D. The Company will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. Unions

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

A. The Company will use its best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

B. The Company will use its best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be

contractually bound to refer applicants without regard to their race, color, religion, sex, or national origin, etc.

C. The Company is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the Company, the Company shall so certify to the Connecticut Department of Transportation and shall set forth what efforts have been made to obtain such information.

D. In the event the union is unable to provide the Company with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the Company will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex or national origin, etc. making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that there shall be no excuse that the union with which the Company has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the Company from meeting the obligations pursuant to Executive Order 11246, as amended, and these provisions, such Company shall immediately notify the Connecticut Department of Transportation.

9. Subcontracting

A. The Company will use its best efforts to solicit Bids from and to utilize minority group subcontractors, or subcontractors with meaningful minority group and female representation among their employees. Companies shall obtain a list of applicable Disadvantaged Business Enterprise firms from the Division of Contract Compliance.

B. The Company will use its best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

C. The General Contract Provisions entitled “Minority Business Enterprises as Subcontractors” is made part of this document by reference and its requirements are applicable to all entities proposing to do business with the Connecticut Department of Transportation.

10. Records and Reports

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

A. The number of minority and non-minority group members and women employed in each work classification on the project.

B. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to

Companies which rely on whole or in part on unions as a source of their work force).

C. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and

D. The progress and efforts being made in securing the services of minority and female owned businesses.

(1) All such records must be retained for a period of three (3) years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the State Department of Transportation and the U.S. Department of Transportation including consultant firms.

(2) If on-the-job training is being required by the "Training Special Provision", the Company will be required to furnish a Monthly Training Report and Supplement Report (1409) for each trainee.

11. Affirmative Action Plan

A. Contractors, subcontractors, Vendors, suppliers, and all other Companies with contracts, agreements or purchase orders completely state funded will submit an Affirmative Action Plan if the contract value is $5,000 or over.

B. Contractors, subcontractors, Vendors, suppliers, and all other Companies with federally assisted contracts, agreements, or purchase orders valued at $10,000 or more will submit an Affirmative Action Plan.

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

EXHIBIT C
PROCUREMENT AND APPEALS PROCESS

GHTD PROCUREMENT PROCEDURES AND APPEALS PROCESS

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

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

1. Pre-Bid

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

2. Pre-award

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

3. Post-Award

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

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

All Protests must be filed in writing to:

Douglas C. Holcomb, Executive Director
Greater Hartford Transit District
One Union Place
Hartford, CT 06103

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

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

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

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

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

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

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

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

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

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

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

EXHIBIT D
BID PROPOSAL FORM

BID PROPOSAL FORM

APPLICABILITY:	This section applies to all work related to the IFB/contract.
RELATED DOCUMENTS:	Addenda and general provisions of the Contract.
SUMMARY:	This Section specifies the form of the Contractor's submittal
PROJECT IDENTIFICATION:	GHTD IFB#01-026 Roof Drain Line Repair at Hartford Union Station Re-Bid

SUBMISSION PROVIDED TO THE OWNER:

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

_____

Company Name (Please print or type)

_____

Address (Street, city, state, zip)

_____

Phone Number:_____ Fax Number:_____

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

_____

Authorized Signature:

I certify that I am an official of_____and have the authority to execute this Bid Proposal. The undersigned hereby agrees to furnish the equipment and materials as listed below in accordance with the terms, conditions and specifications contained in GHTD #01-026 . The undersigned agrees to provide construction services at One Union Place in Hartford.

The Undersigned understands and acknowledges that the failure to comply with the requirements of these certifications constitutes a non-responsive bid, and thereby, invalidates this entire bid proposal.

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

- A document listing exceptions to and/or variations from the conditions and specifications, if any.
- Warranties, as requested.
- Statement of Bidder's Qualifications.
- Project Manager/Superintendent Resume and Qualifications.
- Executed certifications.
- Hourly rates for individuals involved in activities.
- Bid Bond Documentation.
- Schedule of Values
- List of Subcontractors

SUBMISSION – BASE BID: The base bid shall include the lump-sum costs, as identified below.

1. Project Mobilization shall include General Contractor and subcontractor mobilization costs. Include permits, temporary offices, etc. Provide itemized breakdown, if requested.

2. Project general requirements and all miscellaneous costs associated with completion of work in accordance with the construction documents. This shall include, but not be limited to, shoring, barricades, cleanup, dust and fume control, layout, equipment, waste disposal, documentation, and obstruction removal and replacement.

3. Contract lump-sum prices and unit prices shall include all costs to provide, install, and/or repair work items, including, but not limited to, labor, materials, equipment, shipping/transportation, supervision, overhead, and profits. Quantities shown are estimated, and the actual work quantities may be greater or fewer than these quantities. The Bid unit price shall remain firm regardless of variations between the estimated and actual quantities. The quantities appearing in schedules in the contract documents are approximate only and are prepared for comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted in accordance with the contract unit prices. The Greater Harford Transit

District reserves the right to delete any item, portion, or phase of the work. Bid price for all other work items to remain unchanged.

4. Schedule of work items, quantities, and prices comprising the base bid.

BASE BID

Description – ROOFS: LS1	Quantity	Unit Price	Bid Price
1. Project Mobilization associated with Roofs LS1, Great Hall, and exterior (Note that the work will be phased as to keep one side of the entrance open to the public)	Lump Sum	$	$
2. All work included in Division 1 Specifications section, except sections noted in this table below.	Lump Sum	$	$
3. All work included in Specification Section 015713–Temporary Erosion and Sediment Control	Lump Sum	$	$
4. All work included in Specification Section 021000 – Site Preparation	Lump Sum	$	$
5. All work included in Specification Section 021500 – Excavation Support and Protection	Lump Sum	$	$
6. All work included in Specification Section 024100 - Demolition and Structure Moving	Lump Sum	$	$
7. All work included in Specification Section 033000 – Cast-in-Place Concrete	Lump Sum	$	$
8. All work included in Specification Section 075419 – PVC Roofing	Lump Sum	$	$
9. All work included in Specification Section 092216 – Non-Structural Metal Framing	Lump Sum	$	$
10. All work included in Specification Section 092900 – Gypsum Board Framing	Lump Sum	$	$
11. All work included in Specification Section 220000 – Plumbing (Excluding Add Alternate)	Lump Sum	$	$
12. All work included in Specification Section 310000 – Earthwork	Lump Sum	$	$

13. All work included in Specification Section 321200 – Flexible Paving	Lump Sum	$	$
14. All work included in Specification Section 321613 Curbs and Gutters	Lump Sum	$	$
15. All work included in Specification Section 330000 - Utilities	Lump Sum	$	$
16. All work included in Specification Section 334200 – Stormwater Systems	Lump Sum	$	$
17. All other work not included in Items 1-16 above.	Lump Sum	$	$
TOTAL		-	$_____
BASE BID TOTAL IN WORDS			

ADD ALTERNATES

Description – Add Alternate #1 – Drain 5 Pipe Lining	**Quantity**	**Unit Price**	**Bid Price**
1. Project Mobilization Associated with lining Drain Line #5 on north end of building	Lump Sum	-	$
2. All work included with lining Drain line #5	Lump Sum	-	$
ADD ALTERNATE #1 TOTAL			$
ADD ALTERNATE #1 BID TOTAL IN WORDS			
Description – Add Alternate #2 – Drain 5 Replacement	**Quantity**	**Unit Price**	**Bid Price**
1. Project Mobilization Associated with replacing Drain Line #5 on north end of building	Lump Sum	-	$
2. All work included with installing new pipe from roof level to basement and connecting to existing outlet at foundation wall.	Lump Sum	-	$
ADD ALTERNATE #2 TOTAL			$
ADD ALTERNATE #2 BID TOTAL IN WORDS			

ADDENDA

: The undersigned acknowledges receipt of the following:

Addendum No.1 _____

Addendum No. _____

Addendum No. _____

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

Proposed Commencement Date: _____

Proposed Substantial Completion Date: _____

Proposed Final Completion Date: _____

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

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

The base bid proposal is broken down as follows:

Provide Schedule of Values.

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

Work Item/Task	Value	Proposed Subcontractor

EXHIBIT E
REQUIRED FORMS AND CERTIFICATES

AFFIDAVIT

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

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

1. I am the _____of_____(the
(insert title) (insert name of company)
"Respondent") and am authorized on behalf of the Proposer to make this Affidavit.

2. I am over 18 years of age and understand the obligations of an oath.

3. There are no delinquent real and personal property taxes due the State of Connecticut from the Respondent.

4. The Respondent is current on all monetary obligations due the State of Connecticut.

5. The Respondent is currently in compliance with all applicable laws, regulations and ordinances of the United States and, State of Connecticut.

_____
(Insert name of company)

By:

_____

Name: Title:

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

_____day of_____, 20___.

_____
Notary Public

My Commission Expires:

CERTIFICATION OF ELIGIBILITY

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

Signature: _____

Firm: _____

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

A. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this transaction by any Federal department or agency.

B. Have not, within a three-year period preceding the date of this Proposal, been convicted of or had a civil judgment rendered against it for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction, violation of Federal or State anti-trust statues or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statement, or receiving stolen property.

C. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in Paragraph B of this Certification.

D. Have not, within a three-year period preceding the date of this Proposal, had one or more public transactions (Federal, State or local) terminated for cause or default.

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

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

(Check One)

_____ I DO CERTIFY _____ I DO NOT CERTIFY

DATE: _____

SIGNATURE: _____

TITLE: _____

CERTIFICATION OF NON-COLLUSION

The Undersigned certifies, under penalties of perjury:

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

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

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

SIGNATURE: _____

NAME: _____

FIRM: _____

TITLE: _____

DATE: _____

CERTIFICATION OF RESTRICTIONS ON LOBBYING

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

hereby certify that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form, "Disclosure Form to Report Lobbying," in accordance with its instruction as amended.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements), and that all subrecipients shall certify and disclose accordingly.

4. The undersigned acknowledges that this certification is a material representation of fact, upon which reliance is placed at the time that the transaction concerned herewith was made or entered into, and that submission of this certification is a prerequisite for making or entering into such transaction imposed by Section 1352, Title 31, U.S. Code as amended. Any person who fails to file the required certification shall be subject to civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

5. The undersigned certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the undersigned understands and agrees that the provisions of 31 US Code A3801, et seq., apply to this certification and disclosure, if any.

Executed this _____ day of _____, 20_____.

By: _____
Signature & Title of Authorized Official

CONTRACTOR'S STATEMENT ON SUB-CONTRACTORS

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

Authorized Signee:_____

Printed Name: _____

Title: Date: _____

For (Company): _____

OR

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

Name of Company: _____

Address:_____

Contact Person: _____

Telephone #: _____

E-mail: _____

Name of Company: _____

Address:_____

Contact Person: _____

Telephone #: _____

E-mail: _____

CERTIFICATION FOR DISADVANTAGED BUSINESS ENTERPRISE

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

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

The specific goal for this project is a minimum of **7.9%**.

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

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

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

(Attach additional sheets)

[ ] Contractor (if unable to meet the DBE goal of 7.9%) is committed to a minimum of ___% DBE utilization on this contract and will submit documentation demonstrating good faint efforts using the attached form.

SIGNATURE: _____

NAME: _____

FIRM: _____

TITLE: _____

DATE: _____

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

DBE GOOD FAITH EFFORTS DOCUMENTATION FORM
ANNUAL DBE GOAL: 7.9%

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

Date: _____ Area of Expertise: _____

Name: _____ Company Name:_____

Response: _____

_____

Date: _____ Area of Expertise: _____

Name: _____ Company Name:_____

Response: _____

_____

Date: _____ Area of Expertise: _____

Name: _____ Company Name:_____

Response: _____

_____

Date: _____ Area of Expertise: _____

Name: _____ Company Name:_____

Response: _____

_____

Date: _____ Area of Expertise: _____

Name: _____ Company Name:_____

Response: _____

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

Name of bidder/offeror's firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Name of DBE firm: _____

Address: _____

City: _____State: _____ Zip: _____

Telephone: _____

Description of work to be performed by DBE firm:

_____

_____

_____

_____

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

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

By _____ Date:

_____
(Signature)

_____
(Title)

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

BUY AMERICA CERTIFICATION

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

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

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

The bidder or offeror hereby certifies that it **WILL MEET** the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 C.F.R. Part 661 and any amendment thereto.

Date _____

Signature _____

Company Name _____

Title _____

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

The bidder or offeror hereby certifies that it **CANNOT COMPLY** with the requirements of 49 U.S.C. 5323(j)(1) and 49 C.F.R. 661, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Date _____

Signature _____

Company Name _____

Title _____

APPROVED EQUAL FORM

_____
Bidder/ Equipment Manufacturer

IFB Equipment____ Section Number _____ Section Title _____

Bidder's Request:

The District's Response:

Approved: Denied: Noted: See Addendum:

Comments:

Procurement Officer: _____ Date: _____

STATEMENT OF BIDDER'S QUALIFICATIONS

(To be submitted by the Bidder with the Bid)

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

1. Name of Bidder: _____
2. Bidder's Tax Identification Number: _____
3. Permanent Main Office Address: _____

   _____
4. When Organized: _____
5. Organizational structure of business entity (select one):

   _____ General partnership (GP)
   _____ Limited partnership (LP)
   _____ Limited liability corporation (LLC)
   _____ Limited liability partnership (LLP)
   _____ Corporation
   _____ Individual doing business under a trade name (sole proprietor)
   _____ Other (specify)

6. If a Corporation, Where Incorporated: _____
7. How many years have you been engaged in construction under your present firm or trade name:_____
8. Contracts on hand: (Schedule these, showing gross amount of each Contract and the appropriate anticipated dates of completion).

   _____

   _____

   _____

9. General character of work performed by you:

_____

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

_____

_____

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

_____

_____

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

Project	Date	Contact Person	Phone No.

13. List your major equipment available for this Contract.

_____

_____

_____

_____

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

_____

_____

_____

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

_____

_____

_____

16. Give Bank reference.

_____

_____

_____

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

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

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

Business Name _____

Address _____

City _____ State _____ Zip _____

Name of Agent _____

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

Business Name	Address	Ownership Interest (%)

20. Based on the organizational structure of your business, provide a current listing of all corporate officers, principals, general or managing partners, limited partners, managers and members. If sole proprietorship or general partnership, attach trade name certificate filed with the town clerk's office.

21. Submit copies of all required business (trade and occupational) licenses with your response.

22. Your company may be asked to submit information relative to your company's financial statements and/or a Dun & Bradstreet report may be obtained prior to receiving an award. This information will be protected to the fullest extent required by law.

23. Additional information/documentation may be requested subsequent to your responding to this solicitation.

24. The undersigned hereby authorizes and requests any persons, firm, or corporation to furnish any information requested by the Greater Hartford Transit District in verification of the recitals comprising this statement of the Bidder's qualifications.

Dated at_____ this _____ day of _____ 20____.

_____
(Name of Bidder)

By: _____

Title: _____

State of _____)
) SS

County of _____)

_____ being duly sworn,

deposes and says that he/she is

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

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

_____
(Notary Public)

My Commission Expires: _____

EXHIBIT F
STATE OF CONNECTICUT
CONTRACT REQUIREMENTS

REQUIREMENTS OF THE STATE OF CONNECTICUT

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

Signed:_____

_____
Authorized Corporate Official

_____
Date

CONNECTICUT REQUIRED CERTIFICATIONS

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

https://portal.ct.gov/OPM/Fin-PSA/Forms/Ethics-Forms

Check this State of Connecticut Internet site immediately before you submit your proposal in case of any recent changes to the State's contractual requirements. It is the responsibility of the proposer to ensure that any and all up-to-date contract certification forms are properly filled out and submitted with your proposal.

SMALL BUSINESS ENTERPRISE (SBE) CERTIFICATION

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

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

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

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

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

SBE Certification

The contractor hereby acknowledges that **District** has an annual SBE goal of **25%**.

Firm Name: _____

Signature: _____

Title: _____

Date: _____

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

EXHIBIT G
CONNECTICUT DEPARTMENT OF LABOR PREVAILING WAGE BID PACKAGE

Minimum Rates and Classifications
for Building Construction

ID#: 25-10312

Connecticut Department of Labor
Wage and Workplace Standards Division

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

Project Number: IFB #01-026 Project Town: Hartford
State#: FAP#:
Project: Union Station: Roof Drain Line Repairs

CLASSIFICATION	Hourly Rate	Benefits
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	48.81	34.05
2) Boilermaker	48.21	30.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	42.61	34.89 + a
3b) Tile Setter	40.0	32.75
3c) Tile and Stone Finishers	33.0	27.43
3d) Marble & Terrazzo Finishers	34.2	26.23
3e) Plasterer	44.52	29.63

As of: October 8, 2025

3f) Terrazzo Mechanics & Marble Setters	40.6	34.93
------LABORERS------		
4) Group 1: General laborers, carpenter tenders, concrete specialists, wrecking laborers and fire watchers.	35.7	28.85
4) Group 1a: Acetylene Burners (Hours worked with a torch)	36.7	28.85
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	35.95	28.85
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	36.2	28.85
4c) **Group 4: Pipelayers: Licensed P6 -P7 (one or two employees of the total crew who primary task is to perform mating of pipe sections).	36.7	28.85
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	36.45	28.85
4e) Group 6: Blasters, nuclear and toxic waste removal.	38.7	28.85
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	38.7	28.85
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	36.2	28.85
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	35.7	28.85

As of: October 8, 2025

4i) Group 10: Traffic Control Signalman	21.42	28.85
4j) Group 11: Toxic Waste Removers A or B With PPE	38.7	28.85
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	42.03	29.19
5a) Millwrights	43.25	29.13
5b) Carpenter - Welder	42.53	29.19
5c) Carpenter: Working with creosote lumber or acid	43.03	29.19
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	48.25	35.22+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	66.72	38.435+a+b
-----OUTSIDE LINE CONSTRUCTION----		
Groundman	30.87	13.91
Linemen/Cable Splicer	56.12	32.85
8) Glazier (Trade License required: FG-1,2)	43.13	26.50+ a

As of: October 8, 2025

9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	45.25	43.62 + a
----OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone; Hoisting Engineer (2 drums or over). (Trade License Required)	58.19	29.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and Over	53.33	29.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	57.78	29.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	56.79	29.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver ($3.00 premium when operator controls hammer)	52.92	29.80 + a
Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Finegrade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	51.92	29.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper); Goldhofer.	51.42	29.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Spreader, Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24 mandrel).	50.63	29.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	50.63	29.80 + a

Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	50.22	29.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under mandrel).	49.77	29.80 + a
Group 8: Mechanic; Grease Truck Operator; Hydroblaster; Barrier Mover; Power Stone Spreader; Welding; Work Boat Under 26 ft.; Transfer Machine; Rigger Foreman.	49.25	29.80 + a
Group 9: Front End Loader (under 3 cubic yards); Skid Steer Loader regardless of attachments; (Bobcat or Similar); Forklift, Power Chipper; Landscape Equipment (including Hydroseeder); Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	48.67	29.80 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	45.96	29.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	45.96	29.80 + a
Group 12: Wellpoint Operator.	45.87	29.80 + a
Group 13: Compressor Battery Operator.	45.12	29.80 + a
Group 14: Elevator Operator; Tow Motor Operator (solid tire no rough terrain).	43.6	29.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	43.06	29.80 + a
Group 16: Maintenance Engineer.	42.2	29.80 + a

As of: October 8, 2025

Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator; Portable Grout Plant Operator; Portable Water Filtration Plant Operator.	47.91	29.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (Minimum for any job requiring a CDL license); Rigger; Signalman.	44.7	29.80 + a
Surveyor: Chief of Party	48.16	29.80 + a
Surveyor: Assistant Chief of Party	44.41	29.80 + a
Surveyor: Instrument Man	42.73	29.80 + a
Surveyor: Rodman or Chainman	36.78	29.80 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	39.57	26.50
10b) Taping Only/Drywall Finishing	40.32	26.50
10c) Paperhanger and Red Label	40.07	26.50
10d) Spray	42.57	26.50
10e) Spray Helper	40.57	26.50
10f) Blast	44.57	26.50

10g) Blast Helper	40.57	26.50
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	50.58	36.30
12) Well Digger, Pile Testing Machine	37.26	24.05 + a
13) Roofer (composition)	45.15	22.44
14) Roofer (slate & tile)	45.65	22.44
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	44.7	44.38
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	50.58	36.30
------TRUCK DRIVERS------		
17) Block Truck	37.48	32.68 + a
17a) 2 Axle	36.16	32.68 + a
17ab) Helpers	34.66	32.68 + a
17b) 3 Axle, 2 Axle Mixer	36.27	32.68 + a
17c) 3 Axle Mixer	36.33	32.68 + a

As of: October 8, 2025

17d) 4 Axle	36.39	32.68 + a
17e) 4 Axle Mixer	37.19	32.68 + a
17ef) 5 Axle	36.39	32.68 + a
17eg) 5 Axle Mixer	37.19	32.68 + a
17f) Heavy Duty Trailer (40 Tons and Over)	38.66	32.68 + a
17g) Euclids and Semi-Trailer	36.44	32.68 + a
17h) Heavy Duty Trailer up to 40 tons	37.39	32.68 + a
17i) Snorkle Truck	36.54	32.68 + a
17j) Swivel Dump and Tack Truck	36.39	32.68 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	53.76	33.44 + a
19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.
Surveyors: Hazardous material removal: $3.00 per hour premium.
*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.
**Note: Hazardous waste premium $3.00 per hour over classified rate.
Truck Drivers: Trainers Premium: $3.00 over wage rate.
Truck Drivers: Night Premium - Mixer Drivers: $2.00 over wage rate.

As of: October 8, 2025

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

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

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

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.
The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.
The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
All subsequent annual adjustments will be posted on our Web Site for contractor access.
Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

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

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

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

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

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

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

As of: October 8, 2025



CONNECTICUT DEPARTMENT OF LABOR

Partner of the American Job Center Network

THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

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

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

Sec. 31-53b. Worker training requirements for public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (h) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 46 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268, and, on or after July 1, 2012, that any plumber or electrician subject to the continuing education requirements of section 20-334d, who has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration five or more years prior to the date such electrician or plumber begins work on such public works project, has completed a supplemental refresher training course of at least four hours in duration in construction safety and health taught by a federal Occupational Safety and Health Administration authorized trainer.

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

(c) Not later than January 1, 2012, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or, in the case of a supplemental refresher training course, shall include, but not be limited to, an update of revised Occupational Safety and Health Administration standards and a review of required construction hazards training, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety

and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project or, in the case of supplemental refresher training, a student course completion card issued by said Occupational Safety and Health Administration authorized trainer dated not earlier than five years prior to the date such electrician or plumber begins work on such public works project.

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

(P.A. 06-175, S. 1; P.A. 08-83, S. 1; P.A. 10-47, S. 2; P.A. 11-63, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009; P.A. 10-47 made a technical change in Subsec. (a); P.A. 11-63 amended Subsec. (a) by adding provision re supplemental refresher training course for plumbers and electricians subject to Sec. 20-334d, amended Subsec. (c) by adding provisions re regulations and subject matter of refresher training course and refresher training course student completion cards, and made technical changes, effective July 1, 2011.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

November 29, 2006

Notice

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

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

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

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

Forklift Operator:

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

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

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

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

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

Sec. 31-55a. Annual adjustments to wage rates by contractors doing state work. Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

(P.A. 02-69, S. 1.)

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

Construction Manager at Risk/General Contractor/Prime Contractor

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

do hereby certify that the _____
Company Name

_____
Street

_____
City

and all of its subcontractors will pay all workers on the

_____
Project Name and Number

_____
Street and City

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

_____
Signed

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

_____
Notary Public

Return to:

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

Rate Schedule Issued (Date): _____

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

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

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

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

CONTRACTOR NAME AND ADDRESS:

SUBCONTRACTOR NAME & ADDRESS

WORKER'S COMPENSATION INSURANCE CARRIER

POLICY #

EFFECTIVE DATE:
EXPIRATION DATE:

PAYROLL NUMBER | Week-Ending Date | PROJECT NAME & ADDRESS

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

12/9/2013
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER _____OF

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

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

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

Please specify the type of benefits provided:

1) Medical or hospital care _____ 4) Disability_____

2) Pension or retirement _____ 5) Vacation, holiday_____

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

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____of _____, (hereafter known as

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

Section A:

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

a) The records submitted are true and accurate;

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

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

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

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

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

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

_____ _____ _____

(Signature) (Title) Submitted on (Date)

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

Weekly Payroll Certification For Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

Week-Ending Date:

Contractor or Subcontractor Business Name:

WEEKLY PAYROLL

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

*IF REQUIRED

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

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

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

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

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

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

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

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

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

7/13/2009
WWS-CP1

*IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER 1 OF 2

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

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

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

Please specify the type of benefits provided:

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

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

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

CERTIFIED STATEMENT OF COMPLIANCE

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

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

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

Section A:

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

a) The records submitted are true and accurate;

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

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

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

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

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

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

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

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

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

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

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

Information Bulletin
Occupational Classifications

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

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

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

- ***ASBESTOS WORKERS***

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

- ***ASBESTOS INSULATOR***

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

- ***BOILERMAKERS***

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

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

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

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

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

- **LABORER, CLEANING**

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

- **DELIVERY PERSONNEL**

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

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

- ***ELECTRICIANS***

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

- ***ELEVATOR CONSTRUCTORS***

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

- ***FORK LIFT OPERATOR***

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

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

- ***GLAZIERS***

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

- ***IRONWORKERS***

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

- ***INSULATOR***

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

- ***LABORERS***

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

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

- ***PAINTERS***

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

- ***LEAD PAINT REMOVAL***

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

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

- ***PLUMBERS AND PIPEFITTERS***

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

- ***POWER EQUIPMENT OPERATORS***

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

- ***ROOFERS***

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

- ***SHEETMETAL WORKERS***

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

- ***SPRINKLER FITTERS***

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

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

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

- **TRUCK DRIVERS**

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

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

For example:

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

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

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

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

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

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

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

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

Elevator Constructors: Mechanics

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

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

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

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

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

Ironworkers

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

Laborers (Tunnel Construction)

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

Roofers

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

Sprinkler Fitters

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

Truck Drivers

(Heavy and Highway Construction & Building Construction)

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

EXHIBIT H
TECHNICAL SPECIFICATIONS AND SPECIAL PROVISIONS

SERVICE DESCRIPTION

a) Purpose

The District is requesting Competitive Sealed Bids from a qualified firm or firms for the provision of a licensed contractor to perform necessary repairs of the existing roof drain line system located at the Union Station Transportation Facility Complex. The project location is One Union Place, Hartford, CT 06103. The scope of work for this project is based on, and is expected to be performed in accordance with, the specs and drawings as developed by the assigned Architectural and Engineering firm, Simpson, Gumpertz, & Heger (SGH) Associates, Inc.

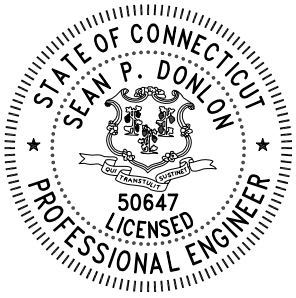
b) Scope of Work

The work on this project consists of replacing and rerouting the existing storm drain lines with new drain lines and the addition of secondary drains. At the roof level, new secondary (emergency) overflow drains will be installed. At the attic level, existing vertical drain lines will be cut and capped, and new drain lines will run into the lower floors, enclosed in a new chase. At the first-floor level, there will be limited demolition of the masonry and brownstone to install two emergency overflow outlets, one at each of the vestibules to the side of the Great Hall. The primary drains will continue below grade, one vertical line at each of the vestibules, and will connect at a new manhole below the sidewalk. Downstream of the new storm manhole, the existing drain line that connects to the Gully Brook storm sewer will be removed and replaced with a new pipe. All drainage work outside of the building will involve demolition of the concrete sidewalk panels and pavers and roadway asphalt to install new pipe. The hardscaping of the site will be restored to the existing conditions. Due to Union Station's historic nature, the successful bidder will be required to coordinate with the State Historic Preservation Office (SHPO) for all brownstone masonry repairs and demolition.

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

Union Station Transportation Center
One Union Place
Hartford, CT
September 24, 2025

SGH Project 230979
GHTD Project #01-026



Prime and For Civil Engineering



For Architecture



For Plumbing Engineering

PREPARED FOR

Greater Hartford Transit District
Ms. LaShaunda Drake
One Union Place
Hartford, CT 06103

PREPARED BY

Simpson Gumpertz & Heger Associates, Inc.
480 Totten Pond Road
Waltham, MA 02451
O: 781.907.9000

Union Station Transportation Center
Roof Drain Line Repair at Hartford Union Station
One Union Place
Hartford, CT 06103

SIMPSON GUMPERTZ & HEGER ASSOCIATES INC.
480 Totten Pond Road
Waltham, MA 02451

Tel.: 781-907-9000
Fax: 781-907-9009

Contact: Sean P. Donlon (spdonlon@sgh.com)

September 24, 2025 SGH Project 230979

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SECTION 011100

SUMMARY OF WORK

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Drawings, Contract Requirements, and the General Requirements (Division 01) of the Contract for Construction are hereby made a part of this Section.

1.02 SCHEDULE

A. The Contractor shall coordinate with the Owner and update the schedule as necessary.

1.03 SUMMARY

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

B. Work will be performed at the LS1 central roof of Union Station, the Great Hall, and the street in front of One Union Place, Hartford, Connecticut.

C. This property is listed on the National Register of Historic Places. All exterior work performed that impacts the historic building must be in conformance with these Specifications and Drawings and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

D. The work contemplated by the Contract Documents includes the work of all trades required and all labor, equipment, materials, and supervision necessary and incidental to the work indicated. The following descriptions of the work represent a brief summary of the Project. For additional and more-complete information, refer to the Drawings and Technical Specifications.

E. Project Mobilization:

1. This work shall include General Contractor and subcontractor mobilization costs. Include permits, temporary offices, bonding costs, etc.

F. Project General Requirements:

1. This work shall include all miscellaneous work associated with the completion of the work in accordance with the Contract Documents. This shall also include, but not be limited to, protection of works, barricades, cleanup, dust

and fume control, layout, equipment, waste disposal, documentation, and obstruction removal and replacement.

2. The Contractor shall coordinate construction phasing with the Owner. Contractor to maintain at least one means of Ingress Into the front entrance of the Union Station into the Great Hall throughout the duration of the work.

3. The Connecticut Prevailing Labor Wage rates, as included in the Contract Documents, will be used in the construction of this Project.

G. Vertical Granite Curbs and Concrete Sidewalks

1. Remove, regrade, and reset the vertical granite curb as shown on the Drawings. Provide new vertical granite curb to match existing, as necessary to perform the work and as approved by the Owner.

2. Removal and replacement of the existing sidewalks to the nearest joint, as shown on the Drawings. Regrade and provide new concrete sidewalk panels. Match existing as necessary to perform the work and as approved by the Owner.

H. Cast-in-Place Concrete:

1. Remove and dispose of existing concrete slab and provide broom-finished cast-in-place concrete slab as shown on the Drawings.

I. Concrete Pavers

1. Remove and salvage concrete pavers where indicated, as shown on the Drawing. Match existing as necessary to perform the work and as approved by the Owner.

J. Earthwork

1. Prepare trench excavation on sidewalks and road pavement for PVC pipe installation.

2. Prepare compacted gravel base for hot-mix-asphalt (HMA) patching.

K. Erosion and Sedimentation Control

1. Furnishing and installing all erosion and sedimentation control devices for the control of erosion and sedimentation from the site as indicated in the Contract Drawings and as directed by the Engineer.

2. The Contractor shall employ measures to prevent all erosion of, siltation of, sedimentation of, and discharge of soil-bearing water runoff or airborne dust to wetlands, waterways, construction areas, adjacent areas, and off-site areas, according to erosion- and sedimentation-control requirements shown on the Contract Drawings, and requirements of authorities having jurisdiction, resulting from the proposed improvements. The use of sediment filter tube, inlet protection at all catch basins subject to sedimentation, stabilized construction entrance(s), etc., may be required, refer to the Contract Drawings. The Contractor shall be responsible for continued inspection and maintenance of all sediment control devices as indicated. The Contractor shall follow the requirements set forth by the City of Hartford.

3. It is the Contractor's responsibility to update BMP controls as site conditions warrant. More controls may be required per site conditions. The Contractor shall include these costs in the base bid. Any area where erosion is observed must be addressed by the Contractor, whether shown on the plans or not. In the case that downstream erosion is observed, the Contractor must contact the Engineer for recommendations.

4. Furnishing and installing sediment filter tube as indicated and as directed by the Engineer.

5. Implementing dust control operations in accordance with the requirements of the Connecticut Department of Energy & Environmental Protections Title 22a-174.

L. Bituminous Concrete Pavement

1. Saw cutting and removal of the existing pavement.

2. Preparation of the existing gravel base course.

3. Installation of HMA pavement and related work.

4. QA/QC procedures and associated submittals.

M. Drainage Systems

1. Furnishing and installation of PVC pipe and associated pipe cleanouts

2. Furnishing and installation of cast-in-place concrete storm drainage manhole

3. Add internal drainage systems

1.04 EXAMINATION OF SITE AND DOCUMENTS

A. A pre-bid conference will be held at the jobsite on the date and at the time indicated in the Invitation to Bid.

B. Bidders may visit the site on a nonholiday weekday acceptable to the Owner, between the hours of 9:00 a.m. and 3:00 p.m., to visually inspect the location of the work and existing conditions that may affect new work.

C. The bidders are expected to examine and to be thoroughly familiar with all Contract Documents and with the conditions under which the work is to be carried out. The Owner will not be responsible for errors, omissions, and/or charges for extra work arising from the Contractors' or Subcontractors' failure to familiarize themselves with the Contract Documents and conditions.

1.05 CONTRACTOR/SUBCONTRACTOR QUALIFICATION

A. General Bidder must be certified by GHTD for the Project's category of work and for no less than the bid price plus all add alternates, if applicable. General Bidders must submit a valid Certificate of Eligibility and Update Statement with its bid.

B. General Bidders' Update Statement is a public record as defined in CT Gen. Statutes Sec. 1-200(5) and will not be open to public inspection.

C. General Bids shall be submitted on the forms provided in the Contract Documents.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 WORK SEQUENCE

A. Coordinate occupying street parking spaces and all required phases with the Owner.

3.02 WORK HOURS

A. The Contractor can gain access to the premises during the hours specified below. In addition, the Contractor and its personnel will limit themselves to the working premises during working hours. If work needs to be scheduled during times other than those listed below, the Contractor shall inform the Owner one week prior to work.

1. Normal construction activities in accordance with City of Hartford Ordinances:

a. Specific hours to be coordinated with the Owner.

b. Monday to Friday: 7:00 a.m. to 6:00 p.m.

c. Saturday: 7:00 a.m. to 6:00 p.m

3.03 CONTRACTOR USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated within the Construction Documents. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Maintain all vehicular traffic at the adjacent road areas, and safeguards required or necessary to the progress of the Work, and effectively control such traffic in a manner so as to provide minimum hazard to the Work and all persons.

B. Schedule and perform work to afford a minimum of interruption to normal and continuous operation of utility systems. The Contractor shall submit to the Owner and the Engineer for approval a proposed schedule for performing work, including construction of new utilities, rerouting of existing utilities, and final connection of new work to existing work. Schedule shall indicate shutdown time required for each operation.

C. The Contractor shall be aware of the sensitivity of the community to noise, dust, debris, and site maintenance and take appropriate precautions to avoid conflict.

3.04 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements for the standard, except where more rigid requirements are specified or are required by code.

B. Where reference is made in the Contractual Documents to publications and standards issued by associations and societies, the intent shall be understood to specify the current edition of such publications and standards (including tentative revision) in effect on the date of the contract advertisement, notwithstanding any reference to a particular date.

3.05 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference to review the work will be conducted by the Owner and the Engineer.

B. Representatives of the following shall be required to attend this conference:

1. Owner.
2. Owner's Representative.
3. Engineer.
4. Contractor.
5. All Subcontractors.

C. The Contractor shall have a responsible representative at the preconstruction conference to be called by the Owner following the award of the Contract, as well as representatives of field or office forces and major subcontractors. All such representatives shall have authority to act for their respective firms. The preconstruction conference is to be held within five days of Notice to Proceed, or as otherwise determined by the Owner.

3.06 PROJECT MEETINGS

A. Project meetings shall be held on a weekly basis and as required subject to the discretion of the Owner and the Engineer.

B. As a prerequisite for monthly payments, ordering schedules, shop drawing submittal schedules, and coordination meeting schedules shall be prepared and maintained by the Contractor and shall be revised and updated on a monthly basis, and a copy shall be submitted to the Owner and the Engineer.

C. In order to expedite construction progress on this Project, the Contractor shall order all materials immediately after the approval of Shop Drawings and shall obtain a fixed date of delivery to the Project site for all materials ordered that shall not impede or otherwise interfere with construction progress. The Contractor shall present a list and written proof of all materials and equipment ordered (through purchase orders). This list shall be presented at the meetings and shall be continuously updated.

D. Scheduling shall be discussed with all concerned parties, and methods shall be presented by the Contractor that shall reflect construction completion not being deferred or foreshortened. Identify critical long-lead items and other special scheduling requirements. The project schedule is to include time for submission of shop drawing submittals, time for review, and allowance for resubmittal and review.

E. Project meetings shall be chaired by the Engineer.

F. Minutes of the Project meetings shall be prepared by the Engineer and shall be distributed to all present. The Engineer's meeting minutes shall be the only official meeting record.

3.07 PERMITS, INSPECTION, AND TESTING REQUIRED BY GOVERNING AUTHORITIES

A. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having any jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Engineer, the Owner, and such Authority timely notice (five business days minimum) of its readiness so that the Engineer may observe such inspecting, testing, or approval.

B. Prior to the start of construction, the Contractor shall complete an application to the applicable authorities for a Building Permit. Such Permit shall be displayed in a conspicuous location at the Project site.

C. Unless otherwise specified under the Sections of the Specifications, the Contractor shall pay such proper and legal fees to public officers and others as may be necessary for all permits, inspections, and the due and faithful performance of the work and that may arise incidental to the fulfilling of this Contract. As such, all fees, charges, and assessments in connection with the above shall be paid by the Contractor.

D. The Contractor shall furnish and install all information required by the Building Official and shall secure the general building permit for the work promptly on award of the Contract. The Contractor shall conform to all conditions and requirements of the permit and code enforcement authority. The Contractor shall provide names and license numbers of its responsible representatives to complete the application for permit, and shall receive the permit and promptly distribute copies to Owner and the Engineer.

E. The Contractor and specialized subcontractors, as applicable, shall identify all permits (other than general building permit) required from Authorities Having Jurisdiction over the Project for the construction and occupancy of the work. The Contractor shall prepare the necessary applications and submit required plans and documents to obtain such permits in a timely manner, and shall furnish the required information to the Building Official and obtain the required permits as early as practicable after award of the Contract.

1. The Contractor shall display all permit cards as required by the Authorities and shall deliver legible photocopies of all permits to the Owner and the Engineer promptly upon their receipt.

2. The Contractor shall arrange for all inspections, testing, and approvals required for all permits and shall notify the Engineer and the Owner of such inspections at least three business days in advance (longer if so required in the various Sections of the specifications) so that they may arrange to observe.

3. The Contractor shall comply with all conditions and shall provide all notices required by all permits.

4. The Contractor shall perform and/or arrange for and pay all testing and inspections required by the governing codes and Authorities, other than those provided by the Owner, and shall notify the Engineer and the Owner of such inspections at least three business days in advance of all such testing or inspection so that they may arrange to observe.

5. Where inspecting authorities require corrective work for conformance with applicable codes and Authorities, the Contractor shall promptly comply with such requirements, except in cases where such requirements clearly exceed the requirements of the Contract Documents, in which case the Contractor shall proceed in accordance with the procedures for modifications or changes in the work established in the Contract Documents, as amended.

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes: Administrative and procedural requirements for Alternates.

1. Acceptance or rejection of each Alternate is at discretion of the GHTD. None, any, or all Alternates may be accepted or rejected by the GHTD in order of precedence.

B. Requirements and descriptions for products and scopes of Work identified as Alternates in the Drawings and Specifications and listed as “Add Alternates”on the Bid Proposal Form.

C. Included in this Section: non-technical descriptions of Alternates listed by number only on the Bid Proposal.

D. Included in other Sections: technical specifications for work revising or adding/deducting from Base Bid work by Alternates.

E. Unless otherwise specifically provided, the work described in Alternates shall be completed with no increase in Contract Time.

F. The additional cost or credit for each Alternate shall represent the total adjustment to the contract sum associated with said Alternate.

G. Refer to the Bid Proposal Form for information concerning order of acceptance of alternates.

H. All labor, material, equipment, accessories, and incidental items required for a complete installation shall be included, whether or not specifically mentioned as part of the Alternate. Contractor shall perform necessary modifications or adjustments to affected adjacent work, whether new or existing, in order to fully and properly integrate the Alternate work into the Project. These necessary modifications and adjustments shall be included in the Alternate.

1.03 QUALITY ASSURANCE

A. The Base Bid specifications shall govern work of Alternates unless otherwise noted.

1.04 GENERAL REQUIREMENTS FOR ALTERNATES

A. Coordination:

1. Determine the full effect on the Work of implementing each Alternate, including coordination, modification or adjustment of portions of the Work. Contract Amount included on the Bid Form for each Alternate includes the cost for all work required to incorporate the Alternate.

2. To enable GHTD to compare total costs where alternative materials and methods might be used or where scope of Work might be altered, Bid Alternate Work items have been established as described in this Section.

3. Unless otherwise noted, Alternates will be accepted in the order listed until the Construction Budget is reached.

B. Contract Amount included in Base Bid and as stated in executed Agreement shall include all costs for Work described in Contract Documents.

C. Bid Proposal Form or other means prescribed for submission of proposed cost of Work shall include line items for each Alternate described in this Section. No Alternates other than as described in this Section shall be submitted, except in accordance with product options and substitutions provisions specified in Section 016000 Product Requirements, and using the Section 016300 Substitution Request Form.

D. Each Alternative is identified herein by number. This identification shall be used whenever referring to Work described in Alternate and when submitting cost proposals and payment requests.

E. Alternative construction described in Alternates and revised scopes of Work shall be performed only when such Alternate is made a part of the Work by specific provision in the GHTD-Contractor Agreement, if selected by GHTD prior to execution of the Agreement, or by Change Order or Change Directive if selected subsequent to execution of the Agreement.

F. Costs for Alternates shall be valid for no less than *30* calendar days from date of Notice to Proceed and GHTD may select any or all Alternates during that time. Once an Alternate is selected and the Contract modified for Work as described in the Alternate, changes to return to original scope of Work will be made only by Change

Order or Change Directive in accordance with provisions of the Contract General Conditions for changes.

PART 2 – PRODUCTS AND EXECUTION

2.01 GENERAL

A. If GHTD elects to proceed on the basis of one or more of the described Alternates, Contractor shall make all modifications to Work as required to provide products complete, in place and fully functional, including all labor, equipment, services, and incidental consumables necessary to apply, install and finish Work described in Alternate in accordance with requirements specified in related product Sections of these Specifications.

B. Cost for Alternates shall be complete and include all net increases and decreases in Contract Amount for Work described in Alternate and for all changes in related Work. No claims for additional costs to GHTD will be honored other than as stated in cost proposal for each Alternate.

2.02 SCHEDULE OF ALTERNATES

A. Add Alternate Bid #1 - Drain 5 Pipe Lining

1. Base Bid condition: Replacement of four drain lines from roof level to Gully Brook, and addition of two emergency overflow drain from roof level to grade, and the plumbing, architectural, and civil scope associated with aforementioned work.

2. Alternate Bid condition: Drain 5 pipe on the north end of the building is not functioning properly and requires repairs. This alternative proposes to restore pipe functionality using resin-impregnated liner.

3. Location in contract documents Plumbing Drawing sets.

B. Add Alternate Bid # 2 – Drain 5 Complete Replacement

1. Base Bid condition: Replacement of four drain lines from roof level to Gully Brook, and addition of two emergency overflow drain from roof level to grade, and the plumbing, architectural, and civil scope associated with aforementioned work.

2. Alternate Bid condition: Drain 5 pipe on the north end of the building is not functioning properly and requires repairs. This alternative proposes to remove and replace the drain and pipe from the roof level to its connection to the existing sewers.

3. Location in contract documents Plumbing Drawing sets.

END OF SECTION

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements required for handling Change Orders including, but not limited to:

1. Preliminary procedures.

2. Documentation of proposals and claims.

3. Preparation of Change Orders.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. GENERAL CONDITIONS: Methods of determining cost or credit to Owner resulting from changes in Work made on a time and material basis, and Contractor's claims for additional costs.

2. Section 013300, SUBMITTAL PROCEDURES.

3. Section 016300, SUBSTITUTION REQUEST FORM.

4. Section 017700, CLOSEOUT PROCEDURES.

1.03 DEFINITIONS

A. Change Order: A written order to the Contractor, implementing changes in the work agreed to by the Owner, Contractor, and Designer. Execution by Owner, Contractor, and Designer indicates agreement upon all terms of the change, amends the contract documents as described, and authorizes Contractor to proceed with a change which affects the contract sum and/or the contract time.

1. Form: AIA Document G701, Change Order.

B. Construction Change Directive: A written order to the Contractor, signed by Owner and Designer, which amends the Contract Documents as described, and authorizes

Contractor to proceed with a change which affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.

1. Form: AIA Document G714, Construction Change Directive.

C. Designer's Supplemental Instructions: A written order, instructions, or interpretations, signed by Designer making minor changes in the Work not involving a change in Contract Sum or Contract Time.

1. Form: AIA Document G710, Architect's Supplemental Instructions.

D. Proposal Request: A request to the Contractor, signed by the Designer, for submission of an itemized quotation for changes in the Contract Sum or Contract Time. This is not a Change Order or a direction to proceed with the Work.

1. Form: Change Order, AIA Document G709, Proposal Request.

E. Request for Interpretation: A request from the General Contractor to the Designer soliciting additional information regarding the Contract Documents.

1. Form: General Contractor form subject to approval by the Designer.

1.04 PRELIMINARY PROCEDURES

A. Designer may initiate change by submitting a Proposal Request to Contractor. Request will include:

1. Detailed description of the Change, Products, and location of the change in the Project.

2. Supplementary or revised Drawings and Specifications.

3. The projected time span for making the change and a specific statement as to whether overtime work is, or is not, authorized.

4. A specific period of time during which the requested price will be considered valid.

5. Such request is for information only, and is not an instruction to execute the changes, nor to stop Work in progress.

B. Contractor may initiate changes by submitting a written notice to Designer, containing:

1. Description of the proposed changes.

2. Statement of the reason for making the changes.

3. State of the effect on the Contract Sum and the Contract Time.

4. Statement of the effect on the work of separate contractors.

5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.05 CONSTRUCTION CHANGE AUTHORIZATION

A. In lieu of Proposal Request, Designer may issue a Construction Change Authorization for Contractor to proceed with a change for subsequent inclusion in a Change Order.

B. Authorization will describe change in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.

C. Designer will sign and date the Construction Change Authorization and send it to the Owner for authorization for the Contractor to proceed with the changes.

D. Once authorized by the Owner, the Designer will send the Construction Change Authorization to the Contractor. Contractor shall sign and date the Construction Change Authorization to indicate agreement with the terms therein.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Designer to evaluate the quotation.

B. Provide additional data in detail as acceptable to Designer to support time and cost computations including, but not limited to:

1. Labor required.

2. Equipment required.

3. Products required.

a. Recommended source of purchase and unit cost.

b. Quantities required.

4. Credit for work deleted from Contract, similarly documented.

5. Overhead and profit.

6. Justification for any change in Contract Time or any claim that indicates a time impact. The Contractor shall prepare a CPM schedule analysis as part of any justification.

C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information:

1. Name of the Owner's authorized agent who ordered the work, and date of the order.

2. Dates and times work was performed, and by whom.

3. Time record, summary of hours worked, and hourly rates paid.

4. Receipts and invoices for:

a. Equipment used, listing dates and times of use.

b. Products used, listing quantities.

c. Subcontracts.

D. Document requests for substitutions for Products as specified in Section 016300, SUBSTITION REQUEST FORM.

1.07 PREPARATION OF CHANGE ORDERS

A. Designer will prepare each Change Order.

B. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

1.08 LUMP-SUM/FIXED PRICE CHANGE ORDER

A. Content of the Change Orders will be based on either:

1. Designer's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.

2. Contractor's Proposal for a change, as recommended by Designer.

B. Owner and Designer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

1.09 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Designer's definition of the scope of the required changes.

2. Contractor's Proposal for a change, as recommended by Designer.

3. Survey of completed Work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.

2. Those mutually agreed upon between Owner and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the Work:

1. Owner and Designer will sign and date the Change Order as authorization for Contractor to proceed with the changes.

2. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

D. When quantities of the items cannot be determined prior to start of the Work:

1. Designer and Owner will issue a Construction Change Authorization directing Contractor to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.

2. At completion of the change, Designer will determine the cost of such work based on the unit prices and quantities used.

a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.

3. Designer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.

4. Owner and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.10 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.

B. Periodically revise the Construction Progress Schedule to reflect each change in Contract Time.

1. Revise subschedules to show changes for other items of work affected by the changes.

C. Upon completion of work under Change Order, enter pertinent changes in Record Documents.

PART 2 – PRODUCTS

A. NOT USED

PART 3 – EXECUTION

A. NOT USED

END OF SECTION

SECTION 012900

PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment, and supplements Payments of the General Conditions of the Contract.

1.02 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule, list of Subcontracts, and Submittal Schedule.

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

   a. Contractor's Construction Schedule.

   b. Application for Payment forms, including Continuation Sheets.

   c. List of subcontractors.

   d. Schedule of alternates.

   e. List of products.

   f. List of principal suppliers and fabricators.

   g. Schedule of submittals.

2. Submit the Schedule of Values to the Architect/Designer at the earliest possible date but no later than ten days before the date scheduled for submittal of the initial Applications for Payment.

3. Subschedules: Where Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Specifications Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section. For major trades with total line items exceeding $25,000, provide a separate backup breakdown of each such trade with line items for

identifiable units of work within such trade, each of which has a value not exceeding $25,000. Provide a computed unit price, with labor and material breakdown, for each line total.

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

    a. Project name and location.

    b. Name of the Architect/Designer

    c. Project number.

    d. Contractor's name and address.

    e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section.

    b. Description of Work.

    c. Name of subcontractor.

    d. Name of manufacturer or fabricator.

    e. Name of supplier.

    f. Change Orders (numbers) that affect value.

    g. Dollar value.

    h. Percentage of Contract Sum to nearest one hundredth percent, adjusted to total 100 percent.

    i. Phase Area.

3. Provide a breakdown of the Contract Sum in such detail as the Architect/Designer or Owner may require to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.

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

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

    a. Differentiate between items stored on site and items stored off site. Include requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for all subsequent stages of completion, and for total installed value of that part of the Work.

7. Unit Price Work: Show the line item value of unit cost allowances, as a product of the unit multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

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

9. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders result in a change in the Contract Sum.

1.03 APPLICATIONS FOR PAYMENT

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

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

B. The contractor shall submit a preliminary "pencil" payment requisition for review prior to submitting each finalized payment requisition. The review time shall be based on the submittal requirements including any time required for designer's sub-consultant review.

C. Payment-Application Times: Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

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

E. Application Preparation: Complete every entry on the form. Include notarization and execution of person authorized to sign legal documents on behalf of the Contractor. The Architect/Designer will reject incomplete applications without action.

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

2. Include amounts of Change Orders and Construction Change Directives issued prior to the construction period covered by the application.

F. Transmittal: Submit five signed and notarized original copies of each Application for Payment to the Architect/Designer by a method ensuring receipt within 24 hrs. All copies shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect/Designer.

G. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.

2. When an application shows completion of an item, submit final or full waivers.

3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.

a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

H. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following prerequisites to processing

1. Refer to the CONTRACT.

I. Monthly Application for Payment Administrative actions and submittals, that must precede or coincide with submittal of the periodic Application for Payment, include the following.

1. Refer to the CONTRACT.

J. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. Refer to the CONTRACT.

K. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following.

1. Refer to the CONTRACT.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

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

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

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

C. Related Sections include the following:

1. Division 1 Section 013200 – CONSTRUCTION PROGRESS DOCUMENTATION for preparing and submitting Contractor's Construction Schedule.
2. Division 1 Section 013300 – SUBMITTAL PROCEDURES for preparing submittals for performance of Work.
3. Division 1 Section 015000 – TEMPORARY FACILITIES AND CONTROLS for procedures and coordinating construction facilities and temporary controls.
4. Division 1 Section 017300 – EXECUTION REQUIREMENTS for procedures for coordinating general installation and field-engineering services.
5. Division 1 Section 017700 – CLOSEOUT PROCEDURES for coordinating closeout of the Contract.

6. Division 2 Section 024100 – DEMOLITION AND STRUCTURE MOVING for coordinating pre-demolition meetings.

1.03 DEFINITIONS

A. RFI: A request from the General Contractor to the Architect/Designer soliciting additional information regarding the Contract Documents.

1.04 COORDINATION

A. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.

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

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

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

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

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

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

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

1. Preparation of Contractor's Construction Schedule.

2. Preparation of the Schedule of Values.

3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.

5. Progress meetings.

6. Preinstallation conferences.

7. Startup and adjustment of systems.

8. Project closeout activities.

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

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to Section 024100 – DEMOLITION AND STRUCTURE MOVING for disposition of salvaged materials that are designated as Owner's property.

1.05 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if sequenced fixture removal is required or if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

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

b. Indicate required installation sequences.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect/Designer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 in. but no larger than 30 by 42 in.

3. Number of Copies: Submit digital copies of each submittal. Architect/Designer will return one copy.

    a. Submit digital copies where Coordination Drawings are required for operation and maintenance manuals.

4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

B. Key Personnel Names: Within five days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

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

1.06 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

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

1. Include special personnel required for coordination of operations with other contractors.

1.07 PROJECT MEETINGS

A. General: Attend weekly meetings and conferences at Project site. Meetings also to be hosted virtually on Zoom, unless otherwise indicated.

1. Agenda: Engineer to prepare the meeting agenda and will distribute the agenda to all invited attendees at least one business day in advance. Please notify the engineer if there are additional items to be discussed.

2. Attendees: In addition to representatives of the Owner and Architect/Designer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

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

(1) Review schedule for next period.

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

(1) Interface requirements.

(2) Sequence of operations.

(3) Status of submittals.

(4) Deliveries.

(5) Off-site fabrication.

(6) Access.

(7) Site utilization.

(8) Temporary facilities and controls.

(9) Work hours.

(10) Hazards and risks, including minimum Health and Safety Plan requirements.

(11) Progress cleaning.

(12) Quality and work standards.

(13) Status of correction of deficient items.

(14) Field observations.

(15) RFIs.

(16) Status of proposal requests.

(17) Pending changes.

(18) Status of Change Orders.

(19) Pending claims and disputes.

(20) Documentation of information for payment requests.

4. Reporting: Engineer to distribute minutes of the meeting to each party present and to parties who should have been present.

a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

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

1. Attendees: Authorized representatives of Owner, Architect/Designer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.

b. Phasing.

c. Critical work sequencing and long-lead items.

d. Designation of key personnel and their duties.

e. Procedures for processing field decisions and Change Orders.

f. Procedures for RFIs.

g. Procedures for testing and inspecting.

h. Procedures for processing Applications for Payment.

i. Distribution of the Contract Documents.

j. Submittal procedures.

k. Preparation of Record Documents.

l. Use of the premises and existing building.

m. Work restrictions.

n. Owner's occupancy requirements.

o. Responsibility for temporary facilities and controls.

p. Construction waste management and recycling.

q. Parking availability.

r. Office, work, and storage areas.

s. Equipment deliveries and priorities.

t. First aid.

u. Security.

v. Progress cleaning.

w. Working hours.

x. Coordination with ongoing school activities.

y. Health and Safety Plan Requirements.

z. Temporary Heat Provisions.

aa. Procedures for working in occupied building.

bb. Worker badging requirements.

cc. DBE Participation

3. Minutes: Engineer to record and distribute meeting minutes.

1.08 REQUESTS FOR INTERPRETATION (RFIS)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.

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

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

1. Project name.

2. Date.

3. Name of Contractor.

4. Name of Architect/Designer.

5. RFI number, numbered sequentially.

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

7. Drawing number and detail references, as appropriate.

8. Field dimensions and conditions, as appropriate.

9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.

10. Contractor's signature.

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

    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. RFIs: Use CSI Form 13.2A.

1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect/Designer's Action: Architect/Designer will review each RFI, determine action required, and return it. Allow seven working days for Architect/Designer's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.

b. Requests for approval of substitutions.

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

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

e. Requests for interpretation of Architect/Designer's actions on submittals.

f. Incomplete RFIs or RFIs with numerous errors.

2. Architect/Designer's action may include a request for additional information, in which case Architect/Designer's time for response will start again.

3. Architect/Designer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section 012600 "Contract Modification Procedures."

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

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

1. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.01 SUMMARY

A. This section sets forth administrative and procedural requirements for the Contractor's Construction Schedule, which is required to be in a Critical Path Method (CPM) format.

B. Related Work Specified in Other Sections:

1. Schedule of Values, Projected Pay Requisitions, and Applications for Payment: Section 012900 – Payment Procedures

2. Correlated schedule of submittals is specified in Section 013300 – Submittal Procedures

1.02 PRELIMINARY SCHEDULE

A. Preliminary Submittal: Submit, within five calendar days following receipt of the Executed Contract or Notice to Proceed, whichever is earliest, a detailed schedule for the work, in Gantt chart format.

1.03 CONSTRUCTION SCHEDULE , SUBMITTALS

A. Full Submittal: Upon approval of the sample and milestone dates, prepare and submit the construction schedule. Prepare the schedule with spreadsheet information of Schedule of Values on the left border and Gantt Chart information on the right border.

1. Correlate the Construction Schedule with the Schedule of Values required under Section 012900 – Payment Procedures, so that the value of the Work in place at any time can be definitively determined. Each activity on the construction schedule shall appear on the Schedule of Values.

2. Submit the full detailed schedule to the Architect/Designer and Owner for review and approval within fifteen days following receipt of the Notice to Proceed, and at least five working days before the first Application for Payment is submitted. The Architect/Designer will not review any Application for Payment until the construction schedule has been submitted and approved.

3. Submit the Pay Requisition Projections based on the late start and late finish values of work completed in accordance with the Contract Documents to be achieved by month. The Contractor's progress will be reviewed against the Requisition Projections.

B. Initial Submittal and Review: Submit the copies of the schedule to Architect/Designer for review by Architect/Designer and Owner. Make changes as directed by the Architect/Designer and resubmit within ten calendar days.

1. Acceptance and approval of the Construction Schedule by the Owner and Architect/Designer is a prerequisite to certification of the first Application for Payment.

2. The Architect/Designer's approval of the Construction Schedule shall not relieve the Contractor of responsibility for timing, planning and scheduling of the Work, nor impose any duty on the Architect/Designer or Owner with respect to the timing, planning or scheduling of the Work.

C. Distribution: After the initial schedule has been approved, print, and distribute colored copies of the approved schedule to the Architect/Designer, Owner, Clerk of the Works, subcontractors, and other parties required to comply with scheduled dates. Place one copy in the job site file, and post copies in the Project meeting room and temporary field office.

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

1.04 CONSTRUCTION SCHEDULE, CONTENT AND FORMAT

A. The Start Date for the Construction Schedule shall be the date of the Executed Contract or Notice to Proceed, whichever is earliest.

B. Classes of Work: List as separate classes of work on the spreadsheet and schedules:

1. Each category of work listed in the Schedule of Values

2. Activities by others that have to be coordinated with Contractor's work, such as:

a. Inspections by the Owner's Testing and Inspection Agency.

b. Work by separate contractors.

c. Architect/Designer's inspection at the time of Substantial Completion.

d. Additional subdivisions of work as the Contractor deems necessary to control the progress of the Work, or as requested by the Owner or Architect/Designer.

C. Input from Subcontractors: Require each principal subcontractor to provide detailed information about their own portion of the Work; include this information in the Construction Schedule.

D. Spreadsheet: On the spreadsheet, for each activity, include in the spreadsheet, in a separate column, as a minimum the following information:

1. A code number for the activity.

2. Description of the activity.

3. Early and late start dates. These dates may not be changed after the activity has commenced, and the actual start date has been inserted (see Item 10).

4. Duration.

5. Early and late finish dates. These dates may not be changed after the activity has been completed, and the actual finish date has been inserted (see Item 10).

6. Activity float.

7. Percentage completion.

8. Remaining duration.

9. Predecessor activities and successor activities.

10. Blank columns for Actual Start and Actual Finish dates, to be filled in with each monthly submission.

11. Dollar amount for the activity.

12. Number of tradesmen and laborers required for each activity ("manpower loading").

E. Utilization of Float Time: It is intended by the Owner that the Work should progress as expeditiously as possible. To this end, the Contractor shall proceed with the start of each activity promptly upon the completion of the previous activity or activities on which it depends. If the Contractor completes an activity on the scheduled "early finish date" or sooner, the Contractor shall not expend the "float time" for that activity (if any) but rather reserve it as a safeguard against possible impediments or

delays which may occur later in the progress of the Work. Float time is to be expended judiciously, for the benefit of the Project as a whole, and not for the convenience of the Contractor or the Owner. Neither the Contractor nor the Owner "owns" the project float time; the float time belongs to the Project.

1.05 BI-WEEKLY REPORTS; GANTT CHARTS

A. Report progress on a bi-weekly basis. Evaluate the status of the work to show actual progress and identify problem areas. Include Change Orders and Construction Change Directives within the updated schedule. With each application for payment, submit an updated schedule, accompanied by a written narrative. Submit digital copies of the spread sheet and the Gantt schedule.

B. Include on each Gantt Chart a statement of the resources/personnel intended to be utilized per day during the period covered by that chart, and the percentage completion and total dollar value of each activity to be completed or partially completed up to the first day of the following Gantt Chart period.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Drawings, Contract Requirements, and the General Requirements (Division 01) of the Contract for Construction are hereby made a part of this Section.

1.02 TESTING

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

1.03 SCHEDULE

A. Within ten days after execution of the Contract, submit estimated progress schedules for each phase and subphase of the work.

B. Scheduling shall include provisions for materials' cure time, adverse weather, and materials procurement.

C. Submit drawings showing work areas and traffic flow for each phase of construction.

D. Submit to the Engineer a preliminary and final schedule of Shop Drawing submissions.

E. After the schedule's initial acceptance, at each Progress Meeting, present such revisions to the construction schedule as may be required by current or projected status of the Project.

1.04 SITE USE PLAN

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

1.05 ADMINISTRATIVE ACTIONS AND ADMINISTRATIVE SUBMITTALS

A. The following submittals must precede mobilization:

1. List of subcontractors and qualifications, showing that each subcontractor meets the specific experience requirements of these Specifications. Include reference names and telephone numbers of owners/clients from relevant bs.

2. List of principal suppliers and fabricators.

3. Schedule of Values.

4. Contractor's Construction Schedule.

5. Schedule of principal products.

6. Submittal schedule.

7. List of Contractor's staff assignments.

8. List of Contractor's principal consultants.

9. Copies of permits.

10. Copies of authorizations and licenses from governing authorities for performance of the Work.

11. Initial progress report.

12. Certificates of insurance and insurance policies.

13. Performance and payment bonds.

14. Data needed to acquire Owner's insurance.

1.06 MATERIALS AND PROCEDURES

A. The Contractor shall submit to the Engineer copies of the manufacturer's Specification and Product Data Sheets, Safety Data Sheets (SDSs), and recommended installation procedures, temperature limitations, and mix designs for materials as required by the Technical Sections of the Specifications.

1. Submit the required materials in time to allow for review by the Engineer and resubmittals, if needed, without delaying the work. Do not order materials or start work before receiving the Engineer's written approval. Provide a cover sheet with each submittal indicating the information required in Para. 1.09.B.

B. Submit copies of the manufacturer's printed data, all stamped with the Contractor's approval and stating its intended use, to the Engineer for review. After review of the manufacturer's printed data, the Engineer will stamp the submittal, noting, if necessary, any further action required, and return the copy to the Contractor.

C. All other requirements of this Section also apply to the manufacturer's printed data.

1.07 SHOP DRAWINGS

A. Review and approve Shop Drawings before submitting to the Engineer. Submit checked Shop Drawings stamped with the approval of the Contractor to the Engineer for review per the accepted schedule of Shop Drawing submissions. The Engineer shall review, stamp, and return Shop Drawings to the Contractor within ten working days from the date of receipt of Shop Drawings.

B. The Contractor shall submit Shop Drawings as required by the Technical Sections of the Specifications.

C. Shop Drawings shall demonstrate that the Contractor understands the intent of the design as detailed and specified in the Contract Documents and shall show materials (kinds, quality, shapes, and sizes), details (fabrication, construction, assembly, and installation), and all required dimensions and measurements.

D. From Suppliers, submit Shop Drawings, all stamped with the Contractor's approval, and stating its intended use, to the Engineer for review. After review of the Shop Drawings, the Engineer will stamp the Shop Drawings, noting, if necessary, any further action required, and return the copies to the Contractor. All Shop Drawings shall have final review and approval by the Engineer before materials are ordered or fabrication is begun. Provide the Engineer with a set of the final Shop Drawings, reproduced from the corrected original. Use only unmarked final approved Shop Drawings in the field.

1.08 SAMPLES

A. Receive, check, approve, and stamp all samples required by the Contract Documents before submitting to the Engineer for review. Provide three of each sample.

B. Allow ample time before samples are required for the Work.

C. Label each sample giving a complete description of the material, the intended use, and the name of the party submitting the sample.

1.09 SUBMISSION REQUIREMENTS

A. All submittals shall be submitted in an orderly sequence and sufficiently in advance of construction requirements to allow ample time for checking, resubmitting, and rechecking. Submit one electronic copy of the Shop Drawings, of Project Data, and of each Specification Section. Accompany submittals with transmittal letter, in duplicate.

B. Submittals shall include the following:

1. Date and revision dates.
2. Project title and number.
3. The names of the following:
    a. Engineer.
    b. Contractor.
    c. Subcontractor.
    d. Supplier.
    e. Manufacturer.
    f. Separate detailer, when pertinent.
4. Identification of product or material.
5. Relation to adjacent structure or materials.
6. Field dimension clearly defined as such.
7. Specification Section number.
8. Applicable standards such as ASTM number or Federal Specification.
9. A blank space, 3 in. x 4 in., for the Engineer's stamp at the lower right-hand corner of Drawings when possible.
10. Identification of deviations from the Contract Documents.
11. Contractor's stamp initialed or signed certifying to review of submittal, verification of field measurements, and compliance with the Contract Documents.
12. Include unique numbering of each submittal and submittal item, and sequential numbering of resubmittals. Sequentially number each page and indicate the submittal number and submittal item number on each page.

1.10 RESUBMISSION REQUIREMENTS

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

1.11 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

A. Distribute copies of Shop Drawings and Project Data that carry Engineer's stamp to the following:

1. Contractor's file.

2. Jobsite file.

3. Owner's representative.

4. Record documents file.

5. Subcontractors.

6. Supplier.

7. Fabricator.

1.12 DISTRIBUTION OF SAMPLES

A. Distribute approved samples as required for performance of the Work. Two samples will be returned to the Contractor. Maintain a complete and organized file with one of each sample in the Contractor's site office. Distribute the second sample to the Subcontractor or Supplier based on the Contractor's needs. Provide additional samples where, in the Contractor's opinion, more than two are needed by the Contractor.

1.13 ENGINEER'S RESPONSIBILITIES

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

B. Return submittals to the Contractor for distribution.

C. The Engineer's Stamp will govern the action on all submittals. The stamp will have the following actions with the appropriate category checked:

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

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

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

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

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

Reviewed: Review is only for conformance to the design concept of the Project.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 014000

QUALITY REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

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

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

4. Specific test and inspection requirements are not specified in this Section.

1.03 DEFINITIONS

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

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into

the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: As specified in Section 014000 - Quality Requirements.

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

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

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

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

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

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

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

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.04 CONFLICTING REQUIREMENTS

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

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

1.05 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.

2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.06 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data : For Contractor's quality-control personnel.

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

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

1. Specification Section number and title.

2. Entity responsible for performing tests and inspections.

3. Description of test and inspection.

4. Identification of applicable standards.

5. Identification of test and inspection methods.

6. Number of tests and inspections required.

7. Time schedule or time span for tests and inspections.

8. Requirements for obtaining samples.

1. Unique characteristics of each quality-control service.

1.07 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within ten days of Notice to Proceed and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality assurance and quality control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

2. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In the quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.

2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."

3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.08 REPORTS AND DOCUMENTS

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

1. Date of issue.

2. Project title and number.

3. Name, address, and telephone number of testing agency.

4. Dates and locations of samples and tests or inspections.

5. Names of individuals making tests and inspections.

6. Description of the work and test and inspection method.

7. Identification of product and Specification Section.

8. Complete test or inspection data.

9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking, testing, and inspecting.

11. Comments or professional opinion on whether tested or inspected work complies with the Contract Document requirements.

12. Name and signature of inspector.

13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.

2. Statement on condition of substrates and their acceptability for installation of product.

3. Statement that products at Project site comply with requirements.

4. Summary of installation procedures being followed, whether they comply with requirements, and, if not, what corrective action was taken.

5. Results of operational and other tests and a statement of whether observed performance complies with requirements.

6. Statement whether conditions, products, and installation will affect warranty.

7. Other required items indicated in individual Specification Sections.

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

1.09 QUALITY ASSURANCE

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

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

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

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

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

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

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

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

1. Contractor responsibilities include the following:

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

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

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

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

e. When testing is complete, mockup may be used as part of the final construction.

I. Mockups: As specified in Section 014000 - Quality Requirements.

J. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1.10 QUALITY CONTROL

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

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

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

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

2. Notify testing agencies at least 24 hrs in advance of time when work that requires testing or inspecting will be performed.

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

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

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

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

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

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

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

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

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

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

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

6. Do not perform any duties of Contractor.

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

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.

5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

7. Security and protection for samples and for testing and inspecting equipment at Project site.

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

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

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

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

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 TEST AND INSPECTION LOG

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

1. Date test or inspection was conducted.

2. Description of the work tested or inspected.

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

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

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

3.02 REPAIR AND PROTECTION

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

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements in Section 017329 – Cutting and Patching.

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

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

END OF SECTION

SECTION 014200

REFERENCES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section identifies abbreviations and acronyms and includes definitions of words and phrases used in Contract Documents, definitions of standard Specification language, and explanation of Specification format and content.

1.02 QUALITY ASSURANCE

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.

B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 SUBMITTALS

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

1.04 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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

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

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

D. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated.

1.05 DEFINITIONS

A. General: Basic Contract definitions are as below

B. "Approved": The term "approved" when used in conjunction with the Architect/Designer's action on the Contractor's submittals, applications, and similar requests, is limited to the duties and responsibilities of the Architect/Designer as stated in Contract/General Conditions. Such approval shall not release the Contractor from responsibility to fulfill Contract requirements unless otherwise provided in the Contract Documents.

C. "Architect" or "Designer": Refers to Owner's Prime Consultant, Simpson Gumpertz & Heger Inc and Sub consultants.

D. "Contractor": Refers to the contractor performing the work as outlined in the technical specifications. The contractor is the Sub-Contractor engaged by the General Contractor, or the General Contractor itself.

E. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" are hereby defined as "directed by Architect/Designer," "requested by Architect/Designer," "authorized by Architect/Designer," etc. No implied meaning shall be interpreted to extend the Architect/Designer's responsibility into the Contractor's area of construction supervision.

F. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "General Contractor": is the firm that contracts with the owner for the work. The General Contractor is the prime construction contractor for the project. A General Contractor is responsible for the means and methods to be used in the construction execution of the project in accordance with the contract documents and is responsible for coordinating all Sub-Contractors. The General Contractor is responsible for coordinating and understanding the scope of work of all sub-contractors. Any work not being completed by a contractor shall be performed by the General Contractor.

H. "Indicated": The word "indicated" refers to graphic representations, notes or schedules on Drawings, Paragraphs, or schedules in Specifications, and similar requirements in Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help locate a reference. No limitation on location is intended except as specifically noted.

I. "Install": The term "install" describes operations at the Project site, including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

J. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

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

3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the

Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

K. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

L. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The project site includes areas of the building occupied by the Owner. The extent of the Project site is shown on the Drawings.

M. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

N. "Sub-Contractor": Refers to the Sub-Contractor selected by the General Contractor to perform the work as outlined in the technical specifications. The Sub-Contractor shall coordinate all work with the General Contractor.

O. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

P. "Worksite:" Area of the building/site not currently occupied by the Owner and in space available for performing construction activities.

1.06 SPECIFICATION FORMAT AND CONTENT

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2020 Masterformat numbering system.

B. Specification Content: These Specifications use certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. Theses conventions are explained as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words

interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

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

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Drawings, Contract Requirements, and the General Requirements (Division 01) of the Contract for Construction are hereby made a part of this Section.

1.02 USE OF SITE

A. Meet with the Owner and on-site management to fully discuss the implications of the Work on the facility operations, including material handling, equipment staging, and concrete placement.

B. The Contractor shall use only authorized access along the streets and shall neither block nor interfere with traffic or parking facilities, except as authorized in writing by the Owner.

C. The Contractor shall perform all work without interfering with the scheduled normal operation of the street and parking facilities, except as provided in the Contract, and shall coordinate the work properly with the Owner. The Contractor shall not interfere or disrupt activities without the expressed approval of, and coordination with, the Owner.

D. The Contractor shall convey debris to the ground in approved containers and dispose of debris offsite in a legal manner. The Contractor shall not leave equipment unattended on the ground at any time. The Contractor shall provide suitable barricades and warning signs near work areas as necessary to protect the public.

E. The streets will be open during construction. Protect the streets and occupied spaces, its occupants, users, vehicles, and passersby from all hazards associated with the work. Provide clear, printed, weatherproof professional signage at frequent and key intervals around the site and other locations to direct occupants as necessary. Erect all protection and signage prior to the start of construction. Overhead protection, pedestrian walkways, and barricades must comply with the State Building Code and OSHA standards.

F. All work begun in a work area or phase must be completed prior to mobilization to perform work in the next work area or phase.

G. The Contractor shall provide a two-week notice to on-site management in advance of changing the work area.

H. Contractor to use his own generator. Temporary power service shall comply with OSHA Standards. The Contractor shall maintain these temporary services in good order throughout the Project until repair Work is complete. All extension cords shall be provided by the Contractor or subcontractor requiring the power.

1.03 CONDITION OF USE

A. Maintain strict supervision of the use of temporary services. Enforce conformance with applicable standards. Enforce safe practices. Prevent abuse of services and systems. Prevent damage to finishes. Maintain, service, and clean facilities. Protect systems from freezing. The Owner reserves the right to restrict or disallow the use of facilities and services that are abused by the Contractor, employees, or subcontractors.

1.04 PARKING

A. Only during contract working hours and to the extent available, existing parking facilities located at the construction area will be available for use by the Contractor and their Subcontractors. Such parking areas shall be designated by the Owner. The Owner shall not be responsible for cars, trucks, etc., or their contents, and the Contractor and his Subcontractors and material suppliers will use the designated area with this understanding. Limited parking spaces will be provided by GHTD for contractor to use.

B. Parking is also available for a cost near the site in multiple paid parking lots or metered parking spaces.

C. Post signs where hazards may create poor visibility or new traffic patterns.

D. Ensure emergency vehicle access to the building and adjacent buildings.

1.05 TEMPORARY ELECTRICITY

1. The GHTD will provide access to power at designated locations for Contractor use. Generators are not allowed. Coordinate with the GHTD to identify circuits for construction activities. Do not overload single outlets with multiple plugs. Verify that the capacity of the circuit will sustain the anticipated tool loads.

2. All extension cords shall be provided by the Contractor or subcontractor requiring the power.

1.06 TEMPORARY LIGHTING

A. The Contractor shall provide all additional temporary lighting for the Project.

1. Provide artificial lighting for construction operations when natural or ambient light is not adequate for work. Light values shall be adequate for the task in progress.

2. Provide adequate illumination for safe movement of authorized persons through the Project.

3. Provide adequate illumination for public safety and special warning lighting for hazardous conditions.

4. Provide adequate illumination required to protect the Project site from unauthorized entry.

1.07 TEMPORARY WATER

A. The Contractor may use water from a location designated by the GHTD at no charge for on-site construction purposes.

B. The Contractor shall provide and maintain necessary temporary connections to the source of temporary supply. Make connections to existing facilities using back-flow protection. Take measures to conserve water. Free use of water will be discontinued if, in the opinion of the Engineer or GHTD, water is wastefully used.

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

1.08 TEMPORARY SANITARY FACILITIES

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

1.09 TEMPORARY FIRE PROTECTION

A. The Contractor shall provide adequate fire protection and fire prevention for the Project and in no case less than that required by applicable town, county, state, and federal laws.

B. The existing fire protection sprinkler system is to remain operational for the duration of the Contract.

C. Protect the existing fire protection sprinkler system from damage. Provide secure shoring where existing hangers are damaged or undermined.

D. Damage to the sprinkler system caused by the Contractor's failure to provide adequate shoring or protection will be repaired promptly by the Contractor at no cost to the Owner.

1.10 TEMPORARY CONTROLS MAINTENANCE

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

1.11 FIRST AID

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

1.12 BARRICADES

A. See Section 021000 – Site Preparation for information on chain link fence.

1.13 STAGING

A. All staging, exterior and interior, shall be furnished and erected by the Contractor and maintained in a safe condition.

1. Erection and dismantling of staging shall be performed only by trained, certified, and experienced staging personnel qualified to perform such work.

2. Copies of such certifications, clearly indicating qualifications, shall be provided to the Engineer prior to commencement of such erecting and dismantling work.

1.14 TEMPORARY PROJECT OFFICES AND ENCLOSURES

A. Temporary office space will not be available in the building. The Contractor may provide a portable office trailer in the approved construction area for the Contractor's use. Location to be coordinated with GHTD, if space permits.

1. Contractor is responsible for equipping the temporary field office with electricity, lighting, and plan layout table.

B. Keep the following at the site of the work at all times:

1. The most recent revision of the Drawings and Specifications, including all changes made by addenda, sketches, bulletins, and change orders.

2. Architectural and Structural Drawings representing the original design.

3. Manufacturer Safety Data Sheets (MSDSs Sheets).

4. The most recent issue of approved submittals. Obsolete or unapproved submittals and Material and Safety Data Sheets shall not be kept at the jobsite.

5. All material evaluation reports.

6. Engineer and Contractor field reports and daily Contractor job reports.

7. Health and Safety Plans.

C. Provide temporary enclosures for storage of salvaged and new materials, tools, and other project-related materials. Provide enclosures equipped with heat and ventilation for products requiring controlled conditions. The GHTD will approve and designate locations for additional storage if necessary.

1.15 SECURITY

A. The Contractor shall be responsible for the security of his work area, equipment, tools, materials, and temporary facilities.

B. A login sheet is to be maintained at the temporary office; it will include information such as the subcontractor's name, pieces of equipment brought on site, number of men, time in, and time out.

C. The Contractor shall provide chain link fencing with gates around the construction site and laydown areas. The chain link fencing shall be 6 ft high, galvanized steel, with diamond mesh fabric. The Contractor shall provide all necessary fencing accessories including, but not limited to, doors/gates, tension wire, tension (stretcher) bars, braces, etc., to meet fabric tension requirements. Provide doors/gates in fencing at convenient locations, with locks operated by identical keys at each lock for the construction site and laydown areas. Provide the GHTD with a key. Provide concrete fence post pedestals weighing a minimum of 250 lbs that are able to resist an overturning moment of 250 lbs-ft.

1.16 DUST AND FUME CONTROL

A. The Contractor shall take all necessary precautions to keep dust confined in the present work area. Full-height protective enclosures will be required at the Owner's

discretion; see See Section 021000 – Site Preparation for information on chain link fence.

B. The Contractor shall be responsible for any damage to vehicles due to the construction.

C. Water shall be used during concrete removal, saw cutting, etc., to reduce dust exposure.

1.17 WATER POLLUTION CONTROL

A. Undertake all precautions necessary to prevent discharge of unacceptable pollutants used in and resulting from the Work into the City of Hartford stormwater system.

1.18 DEBRIS CONTROL

A. The Contractor shall remove all debris from areas affected by the work on a daily basis or more often as required to maintain a neat, clean site and dispose of same at authorized dumpsites.

1.19 CONSTRUCTION LOAD

A. Loads on the structure at any time during construction shall not be permitted to exceed design loads of the structure.

1.20 NOISE CONTROL

A. All demolition and construction work that creates excessive noise (air hammer operations, hydrodemolition, scarifying, etc.) shall be reviewed with the Owner as to the types of equipment that the Contractor proposes to use and shall obtain the Owner's approval for such use. Noise limits shall conform to the requirements of the City of Hartford.

1.21 TEMPORARY ENCLOSURES FOR STORAGE

A. The Contractor is to provide temporary enclosures for storage and tools. The temporary enclosures are to be located where designated by the Owner. The area is to be kept clean and must not interfere with safe pedestrian- and vehicle-traffic flow.

B. Upon completion of the Project, remove temporary enclosures from the site, assuming all costs in connection with their removal.

C. The Contractor is to provide sufficient enclosures to prevent access by unauthorized personnel, including adequate lighting, locking mechanisms, etc.

1.22 VEHICLE AND EQUIPMENT PROTECTION

A. All construction activities shall be performed in such a manner so as not to dust, stain, or damage any building elements, equipment, vehicles, etc., within the general vicinity of the construction work area. Any damage to these items shall be cleaned and repaired at the expense of the Contractor.

1.23 EXISTING DRAWINGS AND CONSTRUCTION DOCUMENTS

A. The Owner shall provide the Contractor with one set of architectural and structural drawings representing the original design, if available.

B. The Owner shall provide the Contractor with electronic files of the Construction Drawings and Specifications. The Contractor is responsible for printing the Construction Drawings and Specifications.

1.24 DEBRIS DUMPSTER

A. The Contractor shall locate dumpsters at locations designated by the Owner.

B. The dumpster shall be a closed container and shall be closed at the end of each day. The dumpster is to be placed in a manner that will not inhibit the driveway access or routine vehicular traffic.

1.25 BULK STORAGE

A. Bulk storage is to be located in an area designated by the Owner. Dry storage in the facility is acceptable as long as weight restrictions are met, and such storage areas are approved by the Owner.

1.26 PROTECTION OF WORKS

A. The Contractor shall obtain the advice and recommendations of his installers for procedures to protect their work. Installers are responsible for protecting their work and that of other trades while working at the jobsite or in an area thereof. When the installer is no longer working in the area or at the jobsite, the Contractor shall provide protective measures and materials to ensure that each element will be without damage or deterioration (other than normal weathering for exterior exposed materials) throughout the remainder of the construction period up to the Date of Substantial Completion. Remove protective coverings and materials at the appropriate time, but no later than final cleaning operations.

B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.

C. Remove, store, and replace existing street signage.

D. Protection of works to remain in place until the Date of Substantial Completion; date of removal of protection is subject to the approval of the Owner and Engineer.

1.27 JOBSITE RECORDS

A. The Contractor shall keep the following items in the jobsite office at all times:

1. The most recent revision of the Drawings and Specifications, including all changes made by addenda, sketches, bulletins, and change orders.

2. Architectural and structural drawings representing the original design.

3. Applicable American Concrete Institute (ACI) Standards.

4. Health and Safety Data Sheets (SDS Sheets).

5. Copy of approved dust and fume control plan.

6. The most recent issue of approved submittals. Obsolete or unapproved submittals and Health and Safety Data Sheets shall not be kept at the jobsite.

7. All material evaluation reports.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 015700

TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

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

1.02 SUMMARY

A. Protect building, surrounding buildings and vehicles, building occupants and contents, pedestrians, landscaping, mechanical equipment, and site against all risks associated with this work. The Contractor is solely responsible for the watertight integrity of the roofs, exterior walls, flashing, and adjacent building components at all times during the construction. Repair any damage to original conditions caused by this work to the satisfaction of the GHTD using mechanics skilled in appropriate trade.

B. Provide and maintain temporary means of protection for all materials to be left in place, and for all materials to be removed, stored, and reinstalled. Restore all protected areas and stored materials to their original condition upon completion of the work.

1.03 GENERAL

A. The Contractor shall provide for the safety of the general public in the vicinity of all work areas, as well as provide safety for the workers on the job.

B. Coordinate the work to keep the building watertight at all times. This may require some out-of-sequence work to be scheduled with the other involved contractors to prevent the building from being exposed to the weather.

C. Store all materials removed for reinstallation in a location approved by the Owner. Store materials on pallets, off the ground. Protect all materials from the weather and from damage during storage.

D. Protect all incomplete and exposed areas of the building from the effects of inclement weather at the end of every workday. The building must be maintained in a watertight condition, and all interior finishes must be kept dry throughout the duration of the Work. Do not leave the building unprotected from the weather overnight. Coordinate protection with all trades and the Owner as required so that no gaps in coverage exist.

1.04 SITE AREA PROTECTION

A. Provide barriers, as required, to prevent public access to project areas, to provide for the GHTD's use of the site, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Identify and protect existing utilities. Confer with respective utility company when overhead lines, exposed connections, or underground utilities are within potential contact area of construction activities. Take necessary protective action as part of this Contract.

C. Protect landscape and grounds within and adjacent to Project Area.

1. Protect all trees and vegetation within the construction and lay down areas. Where necessary, install plywood enclosures at the dripline of the tree branches. Do not fasten enclosure to trees.

2. Protect lawn areas by laying down heavy-duty canvas tarpaulins and covering with bark. Repair lawn areas where damaged.

3. Submit proposed protection techniques for review. Proceed only according to approved methods.

D. Protect walkways and curbs where vehicles are expected to cross or park. Use planking or sheet materials to evenly distribute loads from wheels and stabilizers. Take measures to prevent staining or chipping. Restore paving where damaged or made unsightly by construction activities.

E. Protect all mechanical equipment and lines on the exterior walls, roofs, and around the building perimeter. Restore and repair all equipment where damaged.

F. Control water and site drainage. When altering discharge or drainage patterns, direct water to prevent nuisance and hazardous conditions.

G. The premises, including access drives and parking areas, shall be left in a neat, clean, and safe condition at the end of each day's work.

1.05 EXTERIOR AREA PROTECTION

A. Protect all exterior building walls, roofs, and details that are not part of the Work in this project. Provide protection of all windows, louvers, doors, masonry, metal flashings, skylights, and roofs not included in the scope of work during demolition and construction.

1. Protect vertical surfaces with rigid insulation and heavy-duty polyethylene sheets to prevent impact damage and dust penetration.

2. Provide covers, pad, and draping to resist work-related abuse.

B. Provide protection for all mechanical equipment and lines during demolition and construction. Provide covers and pads as required to protect all equipment.

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

1.06 INTERIOR AREA PROTECTION

A. Minimize impact to the building interior for the work of this contract to the greatest extent possible. Where possible, avoid construction workers from walking through the building or accessing the interior.

B. If interior work is necessary or interior finishes will be impacted by the work of this contract, protect existing surfaces and finishes designated to remain. Provide covers, pads, and draping to resist work-related abuse. Tape or seal edges to protect interior spaces from dust and grit. Restrain cover materials that may scrub or abrade finishes. Protect vertical surfaces with rigid insulation and heavy-duty polyethylene sheets to prevent impact damage and dust penetration.

C. Protect all finishes and furnishings from dust and debris during construction. Do not damage interior finishes or furniture with sealant or tape from the temporary protection. Clean all areas upon removal of the temporary protection.

D. Restore finishes that have been damaged or made unsightly to their original condition.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 015713

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Work Included: This Section specifies the following items:

1. Furnishing and installing all erosion and sedimentation control devices for the control of erosion and sedimentation from the site as indicated in the Contract Drawings and as directed by the Engineer.

2. The Contractor shall employ measures to prevent all erosion of, siltation of, sedimentation of, and discharge of soil-bearing water runoff or airborne dust to wetlands, waterways, construction areas, adjacent areas, and off-site areas, according to erosion- and sedimentation-control requirements shown on the Contract Drawings, and requirements of authorities having jurisdiction, resulting from the proposed improvements. The use of sediment filter tube (silt sock) and inlet protection at all catch basins subject to sedimentation. The Contractor shall be responsible for continued inspection and maintenance of all sediment control devices as indicated.

3. It is the Contractor's responsibility to update BMP controls as site conditions warrant. More controls may be required per site conditions. The Contractor shall include these costs in the base bid. Any area where erosion is observed must be addressed by the Contractor, whether shown on the plans or not. In the case that downstream erosion is observed, the Contractor must contact the Engineer for recommendations.

4. Furnishing and installing sediment filter tube as indicated and as directed by the Engineer.

B. Related work described elsewhere:

1. Section 021000 - SITE PREPARATION.

2. Section 310000 – EARTHWORK.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Sediment filter tube shall be stored in a manner that will protect it from the elements. If stored outdoors, it shall be elevated and protected with a waterproof cover.

1.04 PROJECT CONDITIONS

A. Comply with all applicable requirements of governing authorities having jurisdiction. The specifications and drawings are not represented as being comprehensive, but rather convey the intent to provide complete erosion control for both the Authority's and adjacent property.

B. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedime]ntation damage; provide temporary erosion and sedimentation control measures; and to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties in accordance with: the approved sediment and erosion control plan; EPA 832/R-92-005; the requirements of authorities having jurisdiction; or as directed by the Engineer; whichever is more stringent.

C. Erosion control measures shall be established at the beginning of construction and maintained throughout the construction period.

D. Construction activities shall be limited to areas within erosion and sediment control limits, and construction limits shown on the Contract Drawings. No work shall be allowed outside the established limits of work shown on the Contract Drawings without permission of the Authority.

E. Construction activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris, and other pollutants and wastes into streams, rivers, flowing or dry water bodies, lakes, underground water sources, or wetlands.

F. Stockpiled materials shall not be deposited outside the limit of work and on or wetland banks, or other water body perimeters where they can be washed away by high water, or storm runoff, or can in any way encroach upon the water body itself, except as approved by the Engineer. Stockpiled materials shall not be deposited on or next to landscaping or trees designated to remain in place. Stockpile location to be surrounded by properly installed sediment filter tube. Approved stockpile locations shall be maintained in accordance with the provisions of this section and the Contract Drawings.

G. Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.

1.05 QUALITY CONTROL

A. Contractor shall engage a competent Erosion and Sediment Control Inspector and shall organize and schedule inspection and approval of all E&S practices as required by the Contract Documents and as required by the approved Order of Conditions for the project. The contractor shall maintain records throughout construction and shall submit the inspection records per request of the Engineer during construction.

1.06 SUBMITTALS

A. Preconstruction: The Contractor shall submit to the Engineer the following prior to the commencement of the Work:

1. Product Data: Submit product data for all proposed products to be used for erosion and sediment control. Indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material proposed for erosion and sedimentation control.

B. Closeout:

1. Provide the following record documents:

a. All records from Field Quality Control Program.

PART 2 – PRODUCTS

2.01 SEDIMENT FILTER TUBE

A. Sediment filter tube shall be a minimum of 12 in. dia. unless otherwise approved by the Engineer and shall be constructed of multi-filament polypropylene with 100% strength from UV exposure at 1,000 hrs capable of effective filtration of sediment in runoff.

2.02 FILTER FABRIC

A. Filter fabric shall be non-woven geotextile meeting the requirements of AASHTO M288-06 Class 2.

2.03 CATCH BASIN FILTER BAG

A. Catch Basin Filter Bag: Woven polypropylene geotextile, sewn with double needle machine using high strength nylon thread, manufactured to fit the opening of catch basins or drop inlets as required. The product shall have dump straps attached at the bottom to facilitate emptying and have integral lifting loops for removal from the catch basins. The product shall have a restraint cord approximately midway up the sack to prevent bulging and indicate when emptying is required. The product shall have the following minimum average roll value properties:

1. Grab Tensile Strength (lbs): 315 , ASTM D4632
2. Elongation at Failure (%) 15, ASTM D4632
3. Puncture Strength (lbs): 750, ASTM D6241 -22a
4. Trapezoidal Tear (lbs): 125 x 125, ASTM D4533
5. UV Resistance (@500hrs): 80, ASTM D4355
6. Apparent Opening Size: 40 US Std Sieve, ASTM D4751
7. Flow Rate (gal/min/sf): 50, ASTM D4491
8. Permittivity (sec-1): 0.70, ASTM D4491

PART 3 – EXECUTION

3.01 DUST CONTROL

A. Leave existing pavement and/or ground covering in place until the just prior to final earth excavation for purposes of dust control.

B. The Contractor is responsible for keeping dust down at all times, including non-working hours, weekends, and holidays. Sprinkle or treat, with dust suppressors, the soil at the site, and other areas disturbed by construction operations. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning nonparticulate debris, such as steel reinforcing bars. No sandblasting is permitted unless dust therefrom is confined. Only wet cutting of concrete blocks, concrete, and asphalt is permitted.

C. Stop all earthwork when, as determined by the Engineer, dust control procedures have not proved effective in controlling dust. Resumption of work may only begin

when site conditions have improved or constructions procedures are modified to the satisfaction of the Engineer.

3.02 PERIMETER CONTROLS (SEDIMENT FILTER TUBE)

A. Sediment control products shall be positioned as indicated on the Drawings and as necessary to prevent off site movement of sediment produced by construction activities as directed by the Engineer, as shown on the Contract Drawings, and as field determined by the Contractor to be required to adequately control sediment from construction activities.

B. Sediment control products shall be installed as recommended by the manufacturer of the products, as indicated in the Contract Drawings, as required in the approved Order of Conditions and as specified herein. Whichever is most stringent shall control.

C. Sediment controls shall be in place prior to any soil disturbing activities including, but not limited to earthwork, dewatering and excavation.

D. Any disturbed soils shall be stabilized, either permanently or temporarily, within 2 weeks of disturbance or when directed by the Engineer.

3.03 CATCH BASIN FILTER BAGS

A. Provide filter bags in all catch basins within and adjacent to the Limit of Work, as indicated on the Contract Drawings, or as directed by the EOR or City.

B. Install catch basin filter bags protection per the manufacturer's recommendations.

3.04 MAINTENANCE AND CLEANUP

A. Maintain the integrity of erosion control practices as long as they are necessary to control sediment. Promptly repair or replace ineffective practices while they are still necessary.

B. Inspect all erosion and sediment control practices immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected.

C. Make a daily review of the location of barriers in areas where construction activities have changed the natural contour and drainage runoff to ensure that the barriers are properly located for effectiveness. Where deficiencies exist, additional barriers shall be installed as directed by the Engineer.

D. Sediment deposits shall either be removed when the deposit reaches approximately one-half of the height of the barrier or a second barrier shall be installed as directed

by the Engineer. All sediment shall be disposed of in an approved manner at the completion of the work.

E. Erosion control barriers shall remain in place until the Engineer directs that they be removed. Upon removal, remove and dispose of any excess silt accumulations.

F. Erosion control barriers will remain the property of the Contractor, may be re-used at other locations provided the materials meet these specifications requirements, and shall be removed and disposed of at the completion of the Contract unless directed otherwise by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 GENERAL

A. No separate measurement or payment will be made for the work required under this section. All costs in connection therewith shall be part of the Lump Sum for SITE WORK, except as indicated in Paragraph B.

END OF SECTION

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for materials and equipment used for the Project.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to the work of this Section include, but are not limited to:

1. GENERAL CONDITIONS.
2. Section 011000 – SUMMARY OF WORK
3. Section 013300 – SUBMITTAL PROCEDURES
4. Section 017700 – CLOSEOUT PROCEDURES

1.03 MATERIAL AND EQUIPMENT INCORPORATED INTO THE WORK

A. Conform to applicable specifications and standards.

B. Comply with size, make, type and quality specified, or as specifically approved in writing by the Architect/Designer.

C. Manufactured and Fabricated Products:

1. Design, fabricate and assemble in accordance with the best engineering and shop practices.
2. Manufacture like parts of duplicate units to standard size and gages, to be interchangeable.
3. Two or more items of the same kind shall be identical, by the same manufacturer.
4. Products shall be suitable for service conditions.

5. Equipment capacities, sizes, and dimensions shown or specified shall be adhered, unless variations are specifically approved in writing.

D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

E. No asbestos containing products or lead containing products shall be permitted on this Project.

F. All finishes and materials used in this Project shall be low V.O.C.

1.04 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by qualified people to produce workmanship of specified quality.

C. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.05 MANUFACTURERS' INSTRUCTIONS

A. When work is specified to comply with manufacturers' instructions, submit copies of said instructions, as specified in Section 013300 – SUBMITTAL PROCEDURES, distribute copies to persons involved, and maintain one set in field office.

B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and manufacturer's instructions, consult with Architect/Designer.

1.06 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.

B. Transport Products by methods to avoid Product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

C. Provide equipment and personnel to handle Products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and products are undamaged.

1.07 STORAGE AND PROTECTION

A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weathertight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated Products, place on sloped supports above ground. Cover Products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

D. Arrange storage to provide access for inspection. Periodically inspect to assure Products are undamaged and are maintained under required conditions.

E. After installation, provide coverings to protect Products from damage from traffic and construction operations, remove when no longer needed.

1.08 PRODUCT OPTIONS

A. Within thirty days after date of Contract, submit complete list of major Products proposed, with name of manufacturer, trade name, and model.

B. Options:

1. Products specified only by reference standard: Any Product meeting that standard.

2. Products specified by naming several manufacturers: Products of any named manufacturer meeting Specifications.

3. Products specified by naming one or more manufacturers and "or equal": Submit a request for substitution for any manufacturer not specifically named.

1.09 MATERIAL SUBSTITUTIONS

A. Substitutions of products shall comply with requirements and procedures specified herein.

B. Where products or materials are specified by manufacturer's name, trade name or catalog reference, the words "or approved equal" shall be understood to follow unless there is a statement specifically indicating that no substitution will be allowed. An item shall be considered equal to the item so named or described if in the opinion of the Architect/Designer:

1. It is at least equal in quality, durability, appearance, strength and design; including compliance with applicable specifications and compatibility with physical space allocations provided for the item.

2. It performs at least equally the function imposed by the general design for the work.

3. It conforms substantially, even with deviations to the detailed requirements for the item as indicated by the Contract Documents.

C. Should the Contractor, after the award of the Contract, wish to use any products or materials other than those specified, he shall request written permission of the Architect/Designer using Substitution Request Form, Section 016300. His request shall name and adequately describe (including shop drawings) the proposed substitutions, furnish any information requested by the Architect/Designer, and state what difference, if any, will be made in the Contract price, including the cost of changes in the Work, for such substitutions should they be accepted. Upon receiving complete information from the Contractor, the Architect/Designer will consider all aspects of the proposed substitution and advise the Contractor in writing approving or disapproving the substitution. The principal reasons for approval or disapproval of the substitution will be enumerated by the Architect/Designer. Disapproval of the substitution shall not be cause for an increase in Contract price or a delay in schedule.

D. Request constitutes a representation that Contractor:

1. Has investigated the proposed Product and determined that it meets or exceeds, in all respects, specified Product.

2. Will provide the same warranty for substitution as for the specified Product.

3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.

4. Waives claims for additional costs which may subsequently become apparent.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.

F. Architect/Designer will determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

G. Any additional cost, or any loss or damage arising from the substitution of any materials, equipment or execution of work for those originally specified shall be

borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Architect/Designer, unless such substitution was made at the written request or direction of the Owner or the Architect/Designer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 016300

SUBSTITUTION REQUEST FORM

No substitutions will be considered
without this completed substitution request form and supporting documentation.

Substitutions made without completion of this form
will be considered defective work as stated in AIA A201-2017.

Date: _____ Number: _____

Project: Roof Drain Line Repair at Hartford Union Station

To: Simpson Gumpertz & Heger, Inc.

Re: Request for Substitution

The Contractor proposes the following substitution in accordance with the requirements of the Contract Documents:

Scope of Substitution _____

_____

Specification Reference _____

_____

Drawing Reference _____

_____

Reason for Proposed Substitution _____

_____

Benefit to Owner _____

_____

Impact on Project Cost _____

_____

Impact on Project Schedule _____

_____

Impact on Guarantees and Warranties _____

_____

Coordination Required with Adjacent Materials and System _____

_____

List Deviations From Specified Requirements _____

_____

_____

_____

Attachments: Attach supporting documentation sufficient for Architect/Designer to evaluate substitution. Substitution Request Forms submitted without adequate documentation will be returned without review.

Attachments _____

_____

_____

Response Date: List date by which response by Architect/Designer is requested to maintain project schedule and allow sufficient time for inclusion of proposed substitution.

Response Date _____

Submitted By _____

Firm and Address _____

_____

Signature below signifies acceptance of responsibility for accuracy and completeness of information included in this Substitution Request Form.

Authorized Signature _____

ARCHITECT/DESIGNER'S RESPONSE

Notations listed below shall have same meaning as on Architect/Designer's approval stamp. Clarifications to or changes in project schedule or time shall be processed using standard project forms.

Architect's Response

_____ Approved

_____ Approved as Corrected

_____ Revise and Resubmit

_____ Not Approved

_____ Returned Without Review

_____ Resubmit for Record Copy

Remarks _____

_____

_____

_____

_____

_____

Date _____

Signed _____

END OF FORM

SECTION 017300

EXECUTION REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

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

1. General installation of products.
2. Coordination of Owner-installed products.
3. General site preparation
4. Progress cleaning.
5. Protection of existing construction.
6. Correction of the Work.

B. Related Sections include the following:

1. SECTION 013100 – Project Management and Coordination for procedures for coordinating field engineering with other construction activities.
2. SECTION 013233 – Photographic Documentation for submitting photographic documentation.
3. SECTION 017329 – Cutting and Patching for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
4. SECTION 017700 – Closeout Procedures for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.03 SUBMITTALS

A. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed

B. Existing Utilities: The existence and location of the underground and other utilities and construction indicated as existing are not guaranteed.

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

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

a. Description of the Work.

b. List of detrimental conditions, including substrates.

c. List of unacceptable installation tolerances.

d. Recommended corrections.

2. Examine existing mechanical and electrical systems to verify actual locations of connections before equipment and fixture removal and installation.

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

3.02 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by

field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

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

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for interpretation to Architect/Designer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.03 INSTALLATION

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

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize the space available for maintenance and ease of removal for replacement.

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

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

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

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

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

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

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/Designer.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

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

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

3.04 PROGRESS CLEANING

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

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold materials for more than seven days during normal weather or three days if the temperature is expected to rise above 80 F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

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

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

1. Remove liquid spills promptly.

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

D. Existing Work: Keep existing work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not

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

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration.

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

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

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

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

3.05 PROTECTION OF EXISTING CONSTRUCTION

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

3.06 CORRECTION OF THE WORK

A. Repair or remove and replace damage to the existing construction remaining. Restore damaged substrates and finishes. Comply with requirements in SECTION 017329 "Cutting and Patching."

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

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

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

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

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 017329

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting, fitting, and patching work required to complete the Work or to:

1. Make several parts fit together properly.

2. Remove and replace damage to existing work.

3. Remove and replace work not conforming to requirements of Contract Documents.

4. Remove samples of installed work as specified for testing.

5. Include under this section cutting, coring, drilling of holes and openings by the General Contractor where the largest dimension is equal or larger than 16 in., including but not limited to Fire Protection, Plumbing, Heating and Ventilating, and Electrical Work, unless specifically noted otherwise in a particular section of the Specifications.

B. Subcontractors shall drill their own holes if 1-1/2 in. or less in diameter. Holes made by subcontractors shall be accurate and neat and not just punched out. No long slots shall be made.

C. No cutting or patching shall be done which in the opinion of the Architect/Designer will endanger or impair new or existing construction or finish.

1. General Contractor shall not include cutting, coring, drilling, and patching of holes and openings for the work, where the largest dimension is less than 16 in. This work will be done under the particular section, unless noted otherwise.

D. Cutting and patching includes cutting concrete slab to install utilities, piping and conduit.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to the work of this Section include, but are not limited to:

1. Section 011000 – SUMMARY OF WORK; Description of Project.

2. Section 016000 – PRODUCT REQUIREMENTS Substitutions and product options.

3. Section 024100 – DEMOLITION AND STRUCTURE MOVING; Selective demolition and salvage activities.

1.03 QUALITY ASSURANCE

A. Definition: “Cutting and patching” includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed, or for other similar purposes.

2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be "cutting and patching” under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be "cutting and patching.”

3. "Demolition” and “Selective Demolition” are recognized as related-but-separate categories of work, which may or may not require cutting and patching as defined in this section.

B. Permission to patch any items of work does not imply a waiver of the Architect/Designer’s right to require complete removal and replacement in said areas and of said items if, in Architect/Designer’s opinion, patching does not satisfactorily restore quality and appearance of work.

C. Requirements for Structural Work: Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio. Prior to cutting any structural steel or concrete work, contact Architect/Designer in writing. Do not cut any structural steel and concrete work until approval has been granted by the Architect/Designer.

D. Operational and Safety Limitations: Do not cut-and-patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance, or decreased safety.

E. Visual Requirements: Do not cut-and-patch work that is exposed on exterior or in occupied spaces of building, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut-and-patch work, both as judged solely by the Owner or Architect/Designer. Remove and replace work judged by the Owner or Architect/Designer to be visually unsatisfactory.

F. Inspection:

1. All cutting and patching by all trades shall be done under the direction and coordination of the General Contractor.

2. Inspect existing conditions of project, including elements subject to damage or to movement during cutting and patching.

3. After uncovering work, inspect conditions affecting installation of products, or performance of work.

4. Report unsatisfactory or questionable conditions to the Architect/Designer in writing; do not proceed with work until Architect/Designer has provided further instructions.

5. No holes or slots shall be drilled through any structural member. Inspect holes after finishes have been removed to assure that substrate is not structural. No holes to be blindly drilled through walls, ceilings, etc.

1.04 SUBMITTALS

A. Submit a written request to Architect/Designer well in advance of executing any cutting or alteration which affects:

1. Work of Owner or separate contractor.

2. Structural value or integrity of any element of the Project.

3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.

4. Efficiency, operational life, maintenance, or safety of operational elements.

5. Visual qualities of sight-exposed elements to remain.

B. Request shall include:

1. Identification of the Project.

2. Description of affected work.

3. The necessity for cutting, alteration, or excavation.

4. Effect on work of Owner or any separate contractor, or on structural or weatherproof integrity of Project.

5. Description of proposed work:

a. Description of why cutting-and-patching cannot (reasonably) be avoided.

b. Scope of cutting, patching, alteration, or excavation.

c. How it will be performed.

d. How structural elements (if any) will be reinforced.

e. Trades who will execute the work.

f. Products proposed to be used.

g. Extent of refinishing to be done.

h. Approximate dates of the work, and anticipated results in terms of variations from the work as originally completed (structural, operational, visual, and other qualities of significance).

i. Alternatives to cutting and patching.

j. Cost proposal, when applicable.

k. Written permission of any separate contractor whose work will be affected.

C. Should conditions of Work or the schedule indicate a change of products from original installation, Contractor shall submit request for substitution as specified in Section 016300 – Substitution Request Form.

D. Submit written notice to Architect/Designer designating date and time the work will be uncovered.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Except as otherwise indicated or authorized by the Architect/Designer, provide materials for cutting-and-patching which will result in equal-or-better work than the work being cut-and-patched, in terms of performance characteristics and including visual effect where applicable. Comply with the requirements and use materials identical with the original materials where feasible and where recognized that satisfactory results can be produced thereby.

B. Comply with specifications and standards for each specific product involved.

PART 3 – EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.

C. Report unsatisfactory or questionable conditions to Architect/Designer in writing; do not proceed with work until Architect/Designer has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support, as necessary to assure structural value or integrity of affected portion of Work.

B. Provide devices and methods to protect other portions of Project from damage.

C. Provide protection from elements for that portion of the Project, which may be exposed by cutting and patching work.

3.03 PERFORMANCE

A. Where cutting and patching is required to accommodate the removal of salvageable items or removal and replacement of work not conforming to the Contract Documents, cutting and patching shall be performed by the Contractor at no additional cost to the Owner. Contractor is permitted to back-charge responsible subcontractor.

B. Execute cutting and patching by methods which will prevent damage to other work to remain and will provide proper surfaces to receive installation of repairs.

1. In general, where mechanical cutting is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.

2. Prior to cutting any structural steel or concrete work, contact Architect/Designer in writing. Do not cut any structural steel and concrete work until approval has been granted by the Architect/Designer.

3. Weather-exposed or moisture-resistant elements.

4. Sight-exposed finished surfaces.

C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

D. Restore work which has been cut or removed, install new products to provide completed Work in accordance with requirements of Contract Documents.

E. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

1. All penetrations through fire walls, separation walls and floors shall be sealed with fire stop sealant or other approved firestopping material in accordance with local applicable building codes.

2. All penetrations through foundations and exterior walls shall be sealed watertight and shall include proper flashings, drip loops, weatherproof covers, etc. as necessary.

F. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

G. Restore exposed finishes of patched areas to remain; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.

H. Any patches in a smooth painted surface within the work zone, do not have to be painted in the work zone.

END OF SECTION

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for salvaging, recycling and disposing of construction waste, including:

1. Construction waste generated during the salvage of components, and selective demolition and reconstruction. Refer to Section 024100 for Demolition and Structure Moving.

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to the work of this Section include, but are not limited to:

1. Section 015000 – TEMPORARY FACILITIES AND CONTROLS; Environmental-protection measures during construction.

2. Section024100 – DEMOLITION AND STRUCTURE MOVING.

1.03 DEFINITIONS

A. Asphalt Pavement, Brick, and Concrete (ABC) Rubble: Rubble that contains only weathered (cured) asphalt pavement, clay bricks and attached mortar normally used in construction, or concrete that may contain rebar. The rubble shall not be mixed with, or contaminated by, another waste or debris.

B. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

C. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

D. Disposal: Removal offsite of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

E. Recycle: Diversion of demolition and construction waste from the landfill for reuse.

F. Salvage: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS

A. Salvage/Recycle Requirements: Salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:

1. Salvage for Reuse: Refer to Section 024100 – DEMOLITION AND STRUCTURE MOVING.

2. Construction Waste:

a. Gypsum wallboard.

b. Brick and concrete masonry.

c. Reinforced Concrete.

d. Metal wall studs.

e. Damaged Acoustic Ceiling Tile.

f. Piping.

g. Packaging: 100% of the following uncontaminated packaging materials:

(1) Paper, cardboard, boxes, plastic sheet and film, polystyrene packaging, wood crates, plastic pails.

1.05 SUBMITTALS

A. Salvage Plan: Refer to Section 024100 – DEMOLITION AND STRUCTURE MOVING for submittal requirements.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction, including but not limited to, Massachusetts solid waste regulations contained in Regulations of Connecticut State Agencies (RCSA) Section 22a-209.

B. Waste Management Conference: Conduct conference at Project site. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan.

2. Review requirements for documenting quantities of each type of waste and its disposition.

3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for each trade.

6. Provide recycling education and recycling information to Contractor and subcontractor employees working on the project.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 IMPLEMENTATION

A. General: Provide containers, storage, signage, transportation, and other items as required during the entire duration of the Contract.

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Provide recycling education for all workers, subcontractors and suppliers engaged in on-site activities.

2. Distribute recycling educational literature.

3. Provide appropriate recycling signage for containers and workspaces.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

2. Comply with project requirements for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: Available recycling receivers and processors include, but are not limited to, those listed on CT DEEP website on Construction and Demolition Materials Management page.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. For waste which cannot be separated at Project site, co-mingle only with waste which is to be separated later at a recycling facility.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include a list of acceptable and unacceptable materials at each container and bin. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

D. On-site crushing of asphalt pavement, brick, and concrete (ABC) rubble is not allowed. All ABC waste must be transported off-site to an asphalt batching plant or to an ABC crushing or recycling that has been sited and permitted by CT DEEP.

3.03 RECYCLING DEMOLITION WASTE

A. Metals: Separate metals by type if practical.

B. Piping: Separate piping materials by material composition. Deposit in designated containers. Separate supports, hangers, valves, sprinklers, and other components by material type and deposit in designated containers for transport to approved recycling facility.

C. Electrical Devices: Separate switches, receptacles, and other devices by type.

3.04 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on site, break down pallets into component wood pieces and comply with requirements for recycling wood.

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Metals: Separate metals by material type if practical. Stack salvageable structural steel members according to size, type of member, and length.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, the Contractor shall remove waste materials from Project site and legally dispose of them in a landfill, or processing facility acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. For solid waste disposal facilities located in the state of Connecticut, dispose of materials only in facilities which currently comply with applicable regulations, including requirements Connecticut General Statues (CGS) Section 22a-208a and RCSA Section 22a-209.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off the property and legally dispose of waste materials.

END OF SECTION

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements during contract closeout, including, but not limited to:

1. Substantial Completion.

2. Final Acceptance.

3. Record document submittal.

4. Bonds

1.02 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to the work of this Section include, but are not limited to:

1. Section 011100 – SUMMARY OF WORK; Owner occupancy.

2. Section 013300 - Submittal Procedures

1.03 SUBSTANTIAL COMPLETION

A. Prior to requesting inspection for certification of Substantial Completion, complete the following:

1. Submission of "Punch List," prepared by the Contractor, listing incomplete items and stating reason for incompletion and value of incomplete work.

2. On Application for Payment, show 100% completion for portions of work claimed as substantially complete. Submit list of incomplete items, value of incomplete work, and reasons work is not complete.

3. Submission of bonds.

4. Submission of Final Project Record Documents.

5. Final cleaning.

6. Application for reduction of retainage.

7. Consent of surety.

B. Within reasonable time, Designer will inspect to determine status of completion.

C. Should Designer determine Work is not substantially complete, he/she will promptly notify Contractor in writing, giving reasons, therefore. The Designer's notification will be detailed or general as he deems appropriate to the actual status of completion observed.

D. The Contractor shall substantially complete work, and remedy any noted deficiencies, and send a second written notice of Substantial Completion. Designer will re-inspect the Work.

E. When the Designer determines Work is Substantially Complete, he will prepare AIA Document G704, Certificate of Substantial Completion in accordance with the CONTRACT.

F. The Designer shall establish an estimated cost for completion of each item on the "Punch List." The cost of each item shall be calculated as an amount equal to twice the estimated fair trade value of the item to ensure prompt completion. These costs shall be retained from amounts due to the Contractor as described in the General Conditions and Owner-Contractor Agreement. Contractor shall perform all "Punch List" work within five calendar days. If, at the end of the five-day period correction and completion of "Punch List" items have not been accomplished to the satisfaction of the Designer, the Owner may use the retained "Punch List" fund to complete and correct the remaining "Punch List" items, without limiting the Owner's right under other conditions of the Contract Documents.

1.04 FINAL ACCEPTANCE

A. Prior to requesting final inspection for certification of Final Acceptance and final payment, complete the following:

1. Submission of certified "Punch List" stating that each and every item is completed or corrected.

2. Submission of final payment request with releases and supporting documentation.

3. Completion of incomplete Work.

4. Assurances that unsettled claims will be settled.

5. Submission of updated final statement, including accounting for final additional changes to the Contract Sum. Show additional Contract Sum, additions and deductions, previous Change Orders, Total Adjusted Contract Sum, previous payments, and Contract Sum due.

6. Submission of consent of surety.

7. Submission of evidence of final, continuing insurance coverage complying with insurance requirements.

8. Prove that taxes, fees, and similar obligations have been paid.

9. Remove temporary facilities and services.

10. Remove surplus materials, rubbish and similar elements.

11. Certify Work has been inspected for compliance with Contract Documents.

12. Certify Work has been completed in accordance with Contract Documents, and deficiencies listed with Certificate of Substantial Completion have been corrected.

13. Certify equipment and systems have been tested in presence of Owner's representative and are operational.

14. Certify Work is complete and ready for final inspection.

15. Certify materials incorporated have no asbestos containing materials or lead.

16. Acceptance of Work by the Owner.

17. Addition requirements as required by the Contract.

B. The Designer will inspect to verify the status of completion with reasonable promptness.

C. Should Designer consider Work is incomplete or defective, he will promptly notify Contractor in writing, listing incomplete or defective work.

1. Contractor shall take immediate steps to remedy deficiencies and send a second written certification that Work is complete, and Designer will re-inspect the work.

2. When Designer finds Work is acceptable, he will consider closeout submittals.

3. Re-inspection Fees: Should the Designer perform re-inspections due to failure of Work to comply with claims made by the Contractor, the Owner will

compensate Designer for such additional services and deduct the amount of such compensation from final payment to the Contractor.

D. Application for Final Payment: Submit Application for Final Payment in accordance with procedures and requirements of the GENERAL CONDITIONS.

1. The Designer will issue the final Change Order, reflecting approved adjustments to the Contract Sum not previously made by Change Orders.

1.05 RECORD DOCUMENTS

A. General: Maintain a complete set of Record Documents at the site. Do not use Record Documents for construction purposes. Provide access to Record Documents for Designer and Owner's reference

1. Record Drawings: Maintain a clean set of Contract Drawings and shop drawings, updated weekly to show actual work. Give particular attention to concealed items. Record documents shall include the following:

a. Electric services and components.

b. Mechanical services and components.

c. Tel/comm./data services and components.

d. Fire protection services and components.

e. Plumbing services and components.

f. Security system services and components.

2. Record Project Manual: Maintain a clean Project Manual, including Addenda, Change Orders, Designer Field Orders, and other modifications, updated weekly to show changes in actual work performed. Give particular attention to substitutions, selection of options, and similar information.

3. Record Product Data: Maintain one copy of each approved Product Data submittal, updated weekly to show changes from products delivered, work performed, and from manufacturer's recommended installation instructions.

4. Record Samples: Maintain one copy of each approved Sample submitted.

5. Record Field Test Reports: Maintain one copy of each Field Test Report.

6. Daily Progress Reports: Maintain one copy of each Daily Progress Report.

7. Salvage log and plan.

B. Maintenance of Documents and Samples: Store documents and samples in Contractor's field office apart from documents used for construction. Provide files and racks for document storage. Provide locked cabinet or secure storage space for storage of samples. File documents and samples in accordance with CSI format. Maintain documents in clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes. Make documents and samples available at all times for inspection by Designer.

C. Recording: Label each document "PROJECT RECORD" in neat large, printed letters. Record information concurrently with construction progress. Do not conceal any work until the required information is recorded.

D. Drawings: Legibly update all Drawings to record actual construction, including the following:

1. Field changes of dimension and detail.

2. Changes made by Field Order or Change Order.

3. Details not in original Contract Documents.

E. Specifications and Addenda: Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Field Order or by Change Order.

F. Final Record Drawings: The Designer will provide the Contractor with a complete set of Construction Drawings in AutoCAD Release 2018 format. The Contractor shall be responsible for transferring the Contractor’s and subcontractors’ salvage documents to the computer files. The computer drafting work shall be done by an experienced AutoCAD draftsperson and shall be consistent with the layering and conventions used on the Construction Drawing files. The Contractor will be required to sign a release for these files.

G. Submittal: At Contract Closeout, deliver Record Documents to Designer. Accompany submittal with transmittal letter in duplicate, indicating the date, Project title and number, Contractor's name and address, title and number of Record Document, and signature of Contractor or his authorized representative.

1. Submit digital copy of Record Drawings for Designer review.

2. Final Record Drawings incorporating modifications requested by Designer from draft submittal shall be provided to the Designer as follows:

a. One digital copy of originals.

b. One set of blackline prints.

c. Each of the above shall be clearly marked “PROJECT RECORD DRAWING” and bear the date of the printing.

1.06 PLUMBING SYSTEMS

A. General: Prepare and submit plans for all plumbing items installed and existing plumbing. All elbows, cleanouts, and piping shall be clearly identified in the field and on the drawings.

1.07 BONDS

A. General: Assemble all bonds.

B. Number of Original Signed Copies Required: Two each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item including, product or work item, firm name, address, and telephone number.

D. Information Required: Provide the date of beginning of bond and duration of bond.

E. Information for Owner's Personnel: Provide information on the proper procedures in case of failure. Indicate instances which might affect the validity of bond. Indicate Contractor, name of responsible principal, address, and telephone number.

F. Form of Submittal: Prepare duplicate packets of 8-1/2 x 11 in., punched sheets for installation in standard three-ring binder. Fold larger sheets to fit into binders.

1. Cover of Packet: Identify each packet with typed or printed title "BONDS.” List the Project title and number, and name of Contractor.

G. Time of Submittals: Make submittals within ten days after the Date of Substantial Completion, and prior to final request for payment.

1. For items of work where acceptance is delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.08 CONTINGENT PROFESSIONAL SERVICES

A. Should the Designer and/or Owner’s Representative be required to perform additional inspections because of failure of Work to comply with Contractor’s original

certifications, either for Substantial or Final Completion, Owner shall compensate Designer and/or Owner's Representative for additional services, and deduct the amount paid from final payment to the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings for salvaged fixtures and components, salvaged finishes and temporary utilities.

2. Record Specifications.

B. Related Sections include the following:

1. Division 1 Section 017700 – CLOSEOUT PROCEDURES for general closeout procedures.

2. Divisions 2 for specific requirements for Project Record Documents of the Work in those Sections.

1.03 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up Record Prints.

a. Electronic Media: Scanned copy shared with Owner and Designer.

B. Record Specifications: Submit one copy including addenda and Contract Modifications.

PART 2 – PRODUCTS

2.01 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Content: Types of items requiring marking include, but are not limited to, the following:

a. Salvage item catalog identification.

b. Dimensional changes to Drawings.

c. Revisions to details shown on Drawings.

d. Depths of foundations below first floor.

e. Locations and depths of underground utilities.

f. Revisions to routing of piping and conduits.

g. Revisions to electrical circuitry.

h. Temporary Electrical Wiring

i. Actual equipment locations.

j. Duct size and routing.

k. Locations of concealed internal utilities.

l. Changes made by Change Order or construction Change Directive.

m. Changes made following Architect's written orders.

n. Details not on the original Contract Drawings.

o. Field records for variable and concealed conditions.

p. Record information on the Work that is shown only schematically.

2. Mark the Contract Drawings completely and accurately.

3. Mark important additional information that was either shown schematically or omitted from original Drawings.

4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Prints: Record prints shall indicate all new plumbing work. Record Prints shall also indicate location, size, and type of all exposed plumbing within the work area.

C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect/Designer. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:

1. Format: Same CAD program, version, and operating system as the original Contract Drawings.

2. Incorporate salvage item catalog identification, temporary electric wiring, and changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations, where applicable.

3. Refer instances of uncertainty to Architect/Designer for resolution.

4. Architect/Designer will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.

a. Architect/Designer makes no representations as to the accuracy or completeness of CAD Drawings, as they relate to the Contract Drawings.

b. CAD Software Program: The Contract Drawings are available in AutoCAD 2018 or later.

D. Format: Identify and date each Record Drawing, include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.

3. Identification: As follows:

a. Project name.

b. Date.

c. Designation "PROJECT RECORD DRAWINGS."

d. Name of Architect/Designer.

e. Name of Contractor.

2.02 RECORD SPECIFICATIONS

A. Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.

5. Note related Change Orders and Record Drawings, where applicable.

2.03 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 – EXECUTION

3.01 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post salvage items, temporary electric, and changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction.

Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect/Designer's reference during normal working hours.

END OF SECTION

SECTION 021000

SITE PREPARATION

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Provide all labor, materials, equipment, and services necessary to complete the work of this Section as specified herein, as shown on the drawings, or both. The Contractor shall coordinate site preparation and demolition activities for each phase of construction.

B. The work of this Section includes, but is not limited to, the following:

1. Staking layout and limits of work.

2. Installation and removal of temporary construction fence.

3. Salvage indicated materials.

4. Protection of existing improvements to remain.

1.03 RELATED WORK

A. Carefully examine all of the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to, the following:

1. Section 015000 – Construction Facilities and Temporary Controls.

2. Section 020600 – Erosion and Sedimentation Controls.

3. Section 310000 – Earthwork.

1.04 PROJECT CONDITIONS

A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional cost will be allowed because of lack of full knowledge of existing conditions.

B. Preparation and Workmanship: Except as otherwise specified, site preparation, demolition work, and clean up shall be the work of the Contractor. Any item of work not specifically designed to be accomplished by a particular subcontractor shall be considered work of the Contractor.

C. Traffic: Conduct demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

D. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing buildings, paving, services, and all other improvements indicated to remain in place. Locate and identify existing underground utilities within project limit lines. Provide adequate means of protection of all utilities to remain. The Contractor shall contact "CT CBYD" at 1-800-922-4455 prior to beginning any excavation work. The Contractor shall be solely responsible for locating all underground utilities prior to the commencement of work. Locations of existing utilities on the site plans are not warranted to show all existing utilities under or above ground. Existing utilities indicated on the site plans are shown only for the convenience of the Owner's representatives.

1. Protect improvements and surfacing on Owner's property.

2. Restore improvements damaged during construction to their original condition, as acceptable to the Owner and any agencies having jurisdiction.

E. Dust and Pollution Control: Provide dust control for dust generated by the work of this project. Dampen surface as required or use other approved method. Comply with pollution control requirements of the governing authority.

F. Salvageable Improvements: Carefully remove items indicated to be salvaged or reused, and store at the site for future use.

G. Benchmarks: Locate, protect, and maintain benchmarks, monuments, control points, and project engineering reference points.

H. Regulatory controls: All work within this Section must comply with the requirements of all authorities having jurisdiction.

PART 2 – PRODUCTS

2.01 TEMPORARY CONSTRUCTION FENCE

A. Temporary construction fencing shall be 6-foot tall, galvanized chain link on galvanized steel pipe frame panels with moveable rubber surface footings and bolted

brackets to secure panels together. At gate locations, lock two panels together with chain and padlock.

PART 3 – EXECUTION

3.01 TEMPORARY CONSTRUCTION FENCE

A. Install temporary construction fence and gates to secure the limit of work and materials stored on-site.

B. Move temporary construction fencing as required by substantial completion of the work and as required to accommodate pedestrian and vehicular traffic.

C. Remove all temporary fencing at each work area after acceptance of the work by the Owner.

3.02 DISPOSAL OF WASTE MATERIALS

A. Removal from Owner's property: Remove all waste materials from Owner's property in timely and responsible manner and legally dispose of off-site. Accumulation is not permitted. Maintain disposal routes clear, clean, and free of debris. Dumping and/or burning of material on site will not be permitted.

3.03 SALVAGE ITEMS

A. Salvage and store on site the following items.

1. Bench (1) at Work Area #4.

2. All trash receptacles within the limit of work.

3.04 CLEAN UP

A. Keep pavements and areas adjacent to and leading from the site, clean and free of mud, dirt, and debris.

END OF SECTION

SECTION 021500

EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

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

B. The work shall include, but not be limited to, mobilizing, surveying, identifying type and location of utilities to be protected, installing a temporary support of excavation system (SOE), and demolishing the SOE following construction of new adjacent drain structures. This specification assumes that a soldier-pile and lagging system will serve as the temporary SOE.

C. The Contractor shall furnish and install the SOE, and excavate in locations as indicated on the Contract Drawings.

D. Perform work without damaging existing sidewalk, pavement, trees, utilities, and structures adjacent to the excavation.

1.03 RELATED WORK

A. Other specification sections which directly relate to the work of this section include, but are not limited to, the following:

1. Section 310000 – Earthwork.

2. Section 334200 – Stormwater Systems.

B. Latest version of American Society for Testing and Materials (ASTM) standards:

1. ASTM A36 – Standard Specification for Carbon Structural Steel.

2. ASTM A992 – Standard Specification for Structural Steel Shapes.

C. Occupational Health and Safety Administration (OSHA) Publication, 1. 29 CFR 1926 Construction Industry Standards, Subpart P – Excavations.

1.04 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

B. Controlled Low-Strength Material (CLSM): Self-compacting, excavatable, flowable-concrete material.

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

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by EOR.

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

D. Excavation Support Wall: Vertical earth support elements that shield the sidewalls of the excavation.

E. Internal Bracing Elements: Struts, wales, rakers, or other structural elements used inside the excavation to provide lateral support for the excavation and excavation support wall.

F. External Bracing Elements: Tie-backs or other elements anchored to the soil outside the excavation, to provide lateral support for the excavation and excavation support wall.

G. 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.

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

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

1.05 PRECONSTRUCTION MEETINGS

A. Pre-construction Conference: Conduct pre-construction conference at the Project site fourteen days prior to the start of work.

1. At a minimum, the pre-construction conference shall be attended by:

    a. Contractor.

    b. Simpson Gumpertz & Heger Associates, Inc. (SGH), Engineer of Record (EOR).

2. Review methods and procedures related to instrumentation installation, SOE installation, and earth-moving, including, but not limited to, the following:

    a. Extent of excavation, work zones, and staging areas.

    b. Personnel and equipment needed to make progress and avoid delays.

    c. Coordination of Work with utility locator service.

    d. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.

    e. Field quality control.

1.06 SUBMITTALS

A. Submit the following items in time to allow for review by the EOR and resubmittals, if needed, without delaying the work. Do not order materials or start work before receiving the EOR's written approval.

B. Submit the following action submittals for review and approval:

1. Preexcavation Condition Survey and 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 installation of SOE and before earth moving begins.

2. Product Data: For each type of product. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles.

3. Calculations for SOE system, prepared by or under the supervision of a qualified Professional Engineer licensed to perform work in the State of Connecticut. Include predicted lateral movement of SOE support and predicted movement of structures and utilities that are located within a distance of two times the depth of excavation (as measured from the bottom of the excavation support wall).

4. Location, type, dimensions, depth, and condition of utilities, prepared by or under the supervision of a qualified Professional Engineer licensed to perform work in the State of Connecticut: (a) within the footprint of the excavation, (b) located within a distance of at least two times the depth of the excavation from the edge of the SOE, and (c) that may conflict with SOE elements. Perform investigations as necessary to complete this submittal.

5. Means, methods, and sequence for:

    a. SOE installation and removal.

6. Shop Drawings (each to be prepared by or under the supervision of a qualified Professional Engineer licensed to perform work in the State of Connecticut):

    a. For the SOE:

        (1) Include plans, elevations, sections, details, and supporting calculations.

        (2) Show arrangement, locations, and details of excavation support wall.

        (3) Include a written plan for the SOE, including sequence of construction coordinated with progress of excavation.

C. Submit the following informational submittals:

1. The Contractor shall submit to the Owner for review a list containing at least five projects similar in scope and complexity to the project defined herein, completed within the last five years. For each project, the Contractor shall include with this submittal, at a minimum: (1) name of client contact, address, and telephone number; (2) location of project; (3) contract value; and (4) scheduled completion date and actual completion date for the project.

2. Resumes of the Contractor’s staff shall be submitted to the Owner for review as part of the Contractor bid. Only those individuals designated as meeting the qualifications requirements shall be used for the project. The Contractor cannot substitute for any of these individuals without written approval of the Owner or Owner’s Engineer.

    a. The Owner’s Engineer shall approve or reject the Contractor's qualifications and staff within fifteen working days after receipt of the submission. Work shall not be started on any temporary SOE and materials shall not be ordered until the Contractor's qualifications have been approved by the Owner. The Owner may suspend the work

if the Contractor substitutes unqualified personnel for approved personnel during construction. If work is suspended due to the substitution of unqualified personnel, the Contractor shall be responsible for additional costs resulting from the suspension of work and no adjustment in contract time resulting from the suspension of work will be allowed.

1.07 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.08 DESIGN REQUIREMENTS

A. The SOE shall be designed to perform as follows:

1. Resist maximum anticipated loadings calculated for the effects of earth pressure, water pressures, seismic pressures, backfill compaction, construction surcharges, live load, dead load, and wind load from any traffic barriers, lights, overhead signs, or other appurtenances located on top or adjacent to the wall. Compute and provide estimated lateral movement of excavation support wall along the length and depth of excavation.

2. Ensure stability against passive failure of the embedded portion of the vertical wall elements (below the base of the excavation). The minimum factor of safety (FS) shall be 1.5.

3. Compute the overall global stability incorporating the contractor-designed SOE geometry and details. Minimum FS shall be 1.3 for this temporary construction.

4. Ensure stability against uplift at the excavation base or piping. The minimum factor of safety (FS) shall be 1.5.

5. Protect adjacent structures or utilities from damage.

6. The Contractor shall not excavate in areas that will affect or undermine tree roots north of the SOE.

1.09 EXISTING CONDITIONS

A. The Contractor is responsible for identifying type, dimensions, depth, and condition of utilities affected by the excavation and SOE support elements, and performing associated investigations to complete this work as necessary.

B. The Contractor is responsible for contacting utility location services to verify the location of underground utilities before starting the work. The Contractor shall not interrupt any utility serving facilities occupied by the Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify the Owner no fewer than five days in advance of proposed interruption of utility.

2. Do not proceed with interruption of utility without the Owner's written permission.

C. The Contractor shall survey the condition of adjoining and adjacent structures and make records including drawings with crack maps and measured crack widths and photographs of any evidence of settlement or cracking of any adjacent structures. The Contractor's report of this survey shall be delivered to the Owner before work begins.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures are in place.

E. Do not commence earth-moving operations until plant-protection measures are in place.

F. The following practices are prohibited outside of Work zones indicated on the Contract Drawings:

1. Storage of construction materials or debris.

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.

PART 2 – PRODUCTS

2.01 GENERAL

A. The Contractor shall not deliver materials to the site until the EOR has approved the submittals outlined in Part 1 of this Specification.

B. The Contractor shall store soil materials at proposed stockpile areas as part of the Work.

C. The Contractor shall protect the materials from the elements by appropriate means. All lumber and steel components shall be protected from the elements at all times. Cement and additives for concrete shall be stored under cover and protected against moisture, if used.

2.02 PERFORMANCE REQUIREMENTS

A. Provide, design, monitor, and maintain SOE capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads.

1. Design SOE, including comprehensive engineering analysis by a qualified Professional Engineer licensed to perform work in the State of Connecticut.

2. Prevent surface water from entering excavations by grading, dikes, or other means.

3. Install SOE without damaging existing buildings, structures, sidewalk, roadway, utilities, trees, and site improvements adjacent to excavation.

4. Continuously monitor vibrations and movements to ensure stability of excavations and constructed slopes and to prevent damage to permanent structures.

5. Prevent surface water from entering excavations by grading, dikes, or other means.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

2.03 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A36, ASTM A690, or ASTM A992.

C. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of size and strength required for application.

PART 3 – EXECUTION

3.01 PREPARATION

A. Protect adjacent structures and utilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during SOE system operations. Shore, support, and protect utilities encountered.

B. Install SOE systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

C. Locate SOE clear of permanent construction so that construction and finishing of other work is not impeded.

3.02 DEWATERING

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

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation. 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.

C. Provide sump pumps or other appropriate means to dewater along the bottom of the excavation, if necessary. The dewatering operation shall extend no more than 2 ft below the bottom of excavation.

D. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

E. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

F. Operate system continuously until structures have been constructed and fill materials have been placed or until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 FIELD QUALITY CONTROL

A. The Contractor shall provide corrective measures for any SOE system element that does not meet the tolerance requirements described in this Specification. Any proposed corrective measure must be approved by the Owner in writing.

1. Correct detected bulges, breakage, or other evidence of movement to ensure that SOE system remains stable, without additional cost to the Owner.

2. Repair damages to adjacent facilities caused by installation or faulty performance of SOE systems, without additional cost to the Owner.

3.05 PRE-CONSTRUCTION SURVEY

A. Document existing conditions prior to the start of construction activities using a combination of drawings, photographs, video recordings, and associated narratives.

B. The Contractor shall hire a Professional Engineer licensed to perform work in the State of Connecticut to conduct the pre-construction survey with at least three years of experience performing similar surveys.

C. Deliver pre-construction survey documents to the Owner at least ten business days prior to the start of construction activities.

D. Conduct a meeting at least five business days prior to the start of construction with the Owner and Engineer. Once an agreement between the Contractor, Owner and Engineer has been reached in relation to the survey report, the Engineer may recommend additional building-performance monitoring. The Contractor shall install and initiate all required excavation support diagnostic monitoring and building-performance monitoring methods (provided in writing by the Engineer) prior to the start of construction activities.

3.06 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate for stability and to control lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 in. from a horizontal line and not more than 1:100 out of vertical alignment.

1. Splicing of soldier piles shall not be permitted.

2. Excavation shafts shall be drilled for soldier pile installation (i.e., no driving). The methods and equipment used shall be selected by the Contractor.

3. The soldier pile shall be placed in the shaft without difficulty. The Contractor may place up to 2 ft of concrete at the bottom of the shaft to assist in aligning the soldier pile.

4. Place excavatable controlled-low-density-fill with a compressive strength no greater than 50 psi within the annulus between the perimeter of the excavation and soldier pile, up to ground surface.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim wood as required to install lagging. Fill voids behind lagging with soil, and compact.

1. Timber lagging shall be placed from the top down in sufficiently small lifts immediately after excavation to prevent erosion of materials into the excavation. Prior to lagging placement, the soil face shall be smoothed to create a contact surface for the lagging. Large gaps behind the lagging shall be backfilled and compacted prior to applying any loads to the tie-backs.

2. A 1/2 in. gap shall be maintained between each vertically adjacent lagging board for drainage between adjacent lagging sections. In no case shall lagging be placed in tight contact to adjacent lagging.

3. Provide drainage matting or burlap where necessary to allow drainage of groundwater without loss of soil or sand packing.

C. Contractor may propose alternate SOE system, subject to review and approval by Engineer. Provide proposed materials, means and methods, and tolerances for review and approval by the Engineer.

3.07 STORAGE OF SOIL MATERIALS

A. The Contractor shall store all materials off-site. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust and rainwater infiltration.

3.08 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

3.09 REMOVAL AND REPAIRS

A. Remove all lagging in sequence with excavation backfilling work. Backfilled surface shall be maximum 2 ft below removed lagging during lagging removal and backfilling activities.

B. Cut and remove top 3 ft of soldier piles and CLSM within finished surface grade. Abandon remainder of soldier piles and CLSM in place.

C. Repair or replace, as approved by EOR, adjacent work damaged or displaced by removing SOE systems.

3.10 POST-CONSTRUCTION SURVEY

A. The Contractor shall conduct the post-construction survey upon project completion. The Contractor shall document the same structures and conditions as identified in the pre-construction survey, and identify additional areas that have experienced distress.

B. The Contractor shall hire the same engineer as that which performed the pre-construction survey. Deliver post-construction survey documents to the Owner no more than ten business days after project completion.

C. Conduct a meeting with the Owner and EOR to review post-construction survey conditions compared to pre-construction survey conditions. Repair or replace, as approved by EOR, adjacent work damaged or displaced by removing SOE systems.

END OF SECTION

SECTION 024100

SELECTIVE DEMOLITION, SALVAGE, AND RECOVERY OF SALVAGED ITEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Examine Contract Documents for requirements that affect the Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:

1. Section 011000, SUMMARY OF WORK.
2. Section 015000, TEMPORARY FACILITIES AND CONTROLS.
3. Section 017419, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
4. Section 017329, CUTTING AND PATCHING.

1.02 SUMMARY

A. This Section includes removing, salvaging, cleaning, labeling, packaging, cataloging, and storing onsite in an owner designated area the following items for later reinstallation:

1. Sign outside of building. See Drawing Note 11 on Drawing C-1.0.
2. Acoustical ceiling tiles and Ceiling Tiles (To be stored on-site at an area designated by Owner. Salvaged items for owner's use).
3. Vertical Granite Curb.

B. This Section includes removal of the following:

1. Interior partition walls, including metal stud and gypsum walls, brick masonry walls, and concrete masonry walls.
2. Concrete slab-on-grade.
3. Vertical concrete curb.
4. HMA Pavement.
5. Plumbing components and piping.

1.03 SALVAGE

A. Salvaged Items for Reuse in Reconstruction:

1. Document the location of items on plans, elevations, sections, and/or details. Document damage or missing parts on log sheet.

2. Clean salvaged items.

3. Label each item and pack or crate items after cleaning. Label and identify contents of containers.

4. Turn items over to Owner and store in an area onsite designated by the owner.

5. Provide connections, supports, and miscellaneous materials damaged during removal which are necessary to make items functional for use indicated.

B. Salvaged Items for Owner's Use:

1. Clean salvaged items.

2. Label each item and pack or crate items after cleaning. Label and identify contents of containers.

3. Store items in a secure area onsite designated by the owner.

C. Recovery of Salvaged Items

1. Find, document, sort, and recover salvaged items from area designated by owner.

2. Unpack all items and document conditions and confirm items function properly. GHTD representative will review documented conditions.

3. Transport items to point of installation within the building.

4. All items shall be located in the same room they were removed from for installation by subcontractor.

5. General contractor is responsible for salvage recovery and coordination of salvage recovery with subcontractor.

6. Document and submit a list of all damaged or inoperable items to the GHTD Document if items are missing. The contractor will be responsible for making items workable.

1.04 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and turn over to Owner. Items shall be reinstalled prior to submittal completion.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

E. Reinstall: Existing items in storage that were salvaged. Recover stored item and reinstall in finished work.

1.05 MATERIALS OWNERSHIP

A. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.06 SUBMITTALS

A. Qualification Data: For salvage and demolition firm.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of salvage and demolition work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.

2. Interruption of utility services. Indicate how long utility services will be interrupted.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Use of elevator and stairs.

5. Locations of proposed dust- and noise-control temporary partitions and means of egress, including for other occupants affected by selective demolition operations.

6. Coordination of Owner's continuing occupancy of portions of existing building.

7. Means of protection for items to remain and items in path of waste removal from building.

C. Inventory: After salvage is complete, submit a list of items that have been removed and salvaged. Each item shall be cataloged by room number. The Contractor shall clearly demarcate each room number in the workspace, so there is no confusion on room number between employees. The room numbers on the contract plans shall be used. Submit a plan, along with any needed elevations, sections, and/or details showing the location of the item matching the inventory log number. The Contractor shall be solely responsible for confirming existing locations of all removed components. If the locations of items shown on the contract plans are not shown in the correct location, the contractor shall denote these on the plans accordingly. All items shall be clearly labeled with durable markings on the unfinished or unexposed surfaces. The Contractor shall assume all responsibility for providing support for describing the original location of all items and shall provide all services necessary to do. The final plan shall be submitted in electronic AutoCAD compatible format. Any elevations, sections, and/or details can be provided in either handwritten or in electronic AutoCAD compatible format.

D. Inventory of Salvaged Items: Utilize the list showing items that have been removed and salvaged. Each item is cataloged by room number. All items shall be reinstalled in their previous locations (or as close as possible). The contractor is responsible for coordinating the construction with the size and other characteristics of the salvaged items and modifying the construction of other construction items to provide a proper fit.

E. Pre-demolition Photographs or Videotapes: Show existing conditions of existing building and site construction, including finish surfaces that might be misconstrued as damage caused by salvage operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes. Comply with submittal requirements in Division 1 Section 017419 "Construction Waste Management and Disposal."

1.07 QUALITY ASSURANCE

A. Salvage and Demolition Firm Qualifications: An experienced firm that has specialized in salvage and demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Salvage and demolition Conference: Conduct conference at Project site to comply with requirements in SECTION 013100 "Project Management and Coordination." Review methods and procedures related to salvage and demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be salvaged or demolished.

2. Review structural load limitations of existing structure.

3. Review and finalize salvage and demolition schedules and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review areas where existing construction is to remain and requires protection.

1.08 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

1. Comply with requirements specified in SECTION 011000 "Summary of Work."

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities as far as practical.

1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove any items not specifically noted to be Contractor's responsibility on contract drawings or specifications. All items shown on the Contract Drawings indicating demolition are the responsibility of the Contractor.

D. Notify Architect/Designer of discrepancies between existing conditions and Drawings before proceeding with selective demolition and salvage.

E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect/Designer and Owner. Owner will remove hazardous materials under a separate contract.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

2. Refer to SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS for specific requirements.

1.09 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect/Designer.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, and preconstruction videotapes.

1. Comply with requirements specified in SECTION 013220 "Photographic Documentation."

2. Before selective removal and salvage of existing building elements, make permanent record of measurements, materials, and construction details. Measurement sketches on 8-1/2 x 11 in. paper shall be submitted for the following items:

    a. Exterior Brownstone.

    b. Brick Masonry.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during work.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving work area.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.

2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in SECTION 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around work area and to and from occupied portions of building.

2. Protect walls, ceilings, floors, and other existing finish work that are to remain within the work area.

3. Cover and protect furniture, furnishings, and equipment that have not been removed.

4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in SECTION 015000 "Temporary Facilities and Controls."

3.04 SELECTIVE DEMOLITION

A. General: Salvage and demolish existing construction only to the extent shown on plans. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations. Comply with all "Hot Work" requirements of Hartford Fire Department.

4. Maintain adequate ventilation when using cutting torches.

5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

7. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

B. Items Identified for Removal and Storage for Later Reuse:

1. The plumbing and electrical sub-contractors or general contractors shall remove and neatly place all contents, components, and hardware for each salvaged item near the area of removal.

2. Sub-Contractors are responsible for fixture removal as indicated in the specification sections. All other items are the responsibility of the General Contractor or their own salvage Sub-Contractor. Refer to selective demolition and salvage schedule.

3. General Contractor shall clean all salvaged items whether removed by the General Contractor or Sub-Contractor. General Contractor shall clean and repair items to functional condition adequate for intended reuse. Provide connections, supports, and miscellaneous materials damaged during removal which are necessary to make items functional for use indicated.

4. General Contractor shall document, label, and identify each item, and pack or crate items after cleaning.

5. General Contractor shall label and identify contents of containers on the container, log form, and plans.

6. General Contractor shall store items in a secure area (designated by owner) on-site until transport.

7. General Contractor shall transport items to storage area off-site (designated by owner) and return items at a later date.

8. General Contractor shall coordinate delivery.

9. General Contractor shall protect items from damage during transport.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect/Designer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.05 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

B. Concrete Slabs-on-Grade: Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, the Contractor shall remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site. Do not stockpile demolition debris on the existing slab-on-grade. Remove debris material from area as it is generated.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Use electrical-powered equipment whenever possible. Gas-powered equipment will only be allowed to be used inside the building if the Contractor can maintain all indoor air-quality requirements.

3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

4. Comply with requirements specified in SECTION 017419, "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.07 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

B. Existing Items to Be Removed and Reinstalled:

1. All salvage items shall be reinstalled. The Contractor shall be responsible for storage of all salvaged items in bins on site.

3.08 RECOVERY OF SALVAGED ITEMS

A. All salvaged items shall be reinstalled from storage.

B. Reinstall all salvaged items. Refer to manufacturers original installation procedures for installation of all salvaged items. Installation procedures will not be provided by the Owner or Designer. The Contractor shall coordinate obtaining all installation procedures from the original manufacturer as required.

C. Items not reinstalled which were previously salvaged and are located in storage shall be disposed of as directed by the Owner.

D. Contractor shall find, document, sort, and recover salvaged items from trailers on-site and unpack all items and document conditions and confirm each item functions properly. The general contractor shall transport items near to the point of installation. The actual installation shall be performed by general contractor, sub-contractor, and filed sub-bid contractors, if any.

E. All electrical and mechanical items shall be visually inspected. For lighting, perform a visual check for condition, to see that the housing, lenses, ballast, lamp holders, and wiring are intact. Plumbing items shall be visually inspected. Components visibly damaged shall not be installed.

F. All items shall be cleaned, dusted, and washed per manufacturers' requirements prior to installation.

G. The Owner will appoint a representative to review the contractors' work to document the existing conditions of items.

H. All items shall be located in the same room they were removed from.

I. General contractor is responsible for all coordination and recovery of all salvaged items from storage.

J. Painting and refinish existing items as indicated in technical sections describing the reinstallation.

K. Document and submit a list of all damaged or inoperable items to the GHTD and Designer. Document if items are missing. The contractor is responsible for making items workable, however, the cost of obtaining missing and replacement parts will be paid for by the GHTD. Miscellaneous attachments, such as screws and anchors, shall be provided by the Contractor at no extra cost. Coordinate purchasing replacement fixtures and parts as required to install all items. Allowances for replacement items in the base bid, if any, are indicated in the technical specifications.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 SCOPE OF WORK

A. The Work includes, but is not limited to, providing all labor, materials, equipment, and supervision to accomplish the following cast-in-place concrete Work in accordance with the Drawings and Specifications. Locations of Work are as shown on the Drawings.

1. SIDEWALKS

a. Remove and dispose of existing concrete slab and provide broom-finished cast-in-place, concrete slab as shown on the Drawings.

1.03 RELATED WORK

A. Work related to this Section includes, but is not limited to, the following:

1. SECTION 310000 – EARTHWORK.

2. SECTION 321200 – FLEXIBLE PAVING.

3. SECTION 321613 – CURBS AND GUTTERS.

1.04 REFERENCES

A. The following references are incorporated into these Specifications. These written Specifications take precedence over incorporated references. The references included in the Specifications refer to the most-recent revision of the publication. The Contractor shall have the following references at the Project site at all times and shall be familiar with the reference contents.

1. American Concrete Institute (ACI) ACI 117 – Standard Tolerances for Concrete Construction and Materials.

2. ACI 301 – ACI Standard Specification of Structural Concrete.

3. ACI 304 – Recommended Practice for Measuring, Mixing, Transportation and Placing Concrete.

4. ACI 305 – Hot Weather Concreting.

5. ACI 306 – Cold Weather Concreting.

6. ACI 308 – Standard Practice for Curing Concrete.

7. ACI 309 – Standard Practice for Consolidation of Concrete.

8. ACI 318 – Building Code Requirements for Reinforced Concrete.

9. ACI 347 – Recommended Practice for Concrete Formwork.

10. ACI SP-15 – Field Reference Manual.

11. ACI SP-66 – Detailing Manual.

1.05 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water-to-Cement Ratio: The ratio by weight of water to cementitious materials.

1.06 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Owner.

b. General Contractor (Contractor) for site construction.

c. Independent testing agency responsible for concrete design mixtures.

d. Ready-mix concrete manufacturer.

e. Concrete subcontractor.

f. Engineer of Record (EOR).

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, methods for achieving specified floor and slab flatness and levelness, floor and slab flatness and levelness measurement, and concrete protection.

1.07 SUBMITTALS

A. Qualification Data: For Installer, manufacturer, and independent testing agency.

B. Samples of or manufacturer's data sheets for all materials to be used, each properly labeled.

C. Certifications (in time to prevent delay in the work) by the producers of the materials that all materials supplied comply with all the requirements of the appropriate ASTM International (ASTM) and ACI Standards.

D. Material Test Reports: Provide reports for the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates: Include testing data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

E. Concrete mixing procedures and application and curing procedures.

F. Schedule of time showing areas of work.

G. Plant batching records and truck tickets for all concrete.

1. Material Test Reports: Provide reports for the following, from a qualified testing agency, indicating compliance with requirements:

a. Aggregates: Include testing data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

2. Concrete Mix Proportions: The required average strength used as the basis for selecting concrete proportions, and the test results used for establishing the required average strength and the concrete proportions.

3. Concrete mixing procedures and application and curing procedures.

H. Design Mixtures: For each concrete mixture. The Contractor shall warrant by the submission of the design mixes that such mixes are totally representative of the concrete that he intends to supply to meet the requirements of the Contract

Documents. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Include the following information for each concrete mix design:

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

2. Mix identification designation (unique for each mix submitted).

3. Statement of intended use for mix.

4. Method used to determine the proposed mix design.

5. Compressive Strength at Seven and Twenty-Eight Days: Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard deviation calculation, and determination of required average compressive strength.

6. Gradation of Fine and Coarse Aggregates: Testing data confirming proposed coarse aggregate meets ASTM C33 class designation. Include ASTM test results for aggregates subject to freeze-thaw environment.

7. Proportions of all ingredients, including all admixtures to be added either at the time of batching or at the jobsite.

8. Water-to-cementitious materials ratio.

9. Slump tested in accordance with ASTM C143.

10. Air content of freshly mixed concrete by the pressure method, ASTM C231, or the volumetric method, ASTM C173.

11. Unit Weight of Concrete: ASTM C138.

12. Mill test reports of portland cement chemical and physical analysis and certification of compliance with ASTM C150, Type I.

13. Mill test reports of fly ash chemical and physical analysis and certification of compliance with ASTM C618, Class C or F, if used.

14. Manufacturer's spec data sheets of each concrete admixture, including brand name, manufacturer, and dosage rate range.

15. Certification of aggregate compliance with ASTM C33, including all restrictions on reactive materials, with the additional provision that the effectiveness of the use of a cement with less than 0.60% alkalis (sodium-

oxide equivalent) or other mitigation methods shall be demonstrated by ASTM C1567 or ASTM C1293 testing prior to acceptance.

I. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the EOR.

J. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.

2. Admixtures.

3. Form materials and form-release agents.

4. Semi-rigid joint filler.

5. Joint-filler strips.

K. Floor surface flatness and levelness measurements, indicating compliance with specified tolerances.

L. Field quality-control reports.

M. Minutes of preinstallation conference.

N. Manufacturer's SDS sheets for all materials to be used.

1.08 QUALITY CONTROL AND QUALITY ASSURANCE

A. Conduct a quality control program that includes, but is not limited to, the following:

1. Inspection of all materials to ensure conformity to contract requirements and that all materials are new and undamaged.

2. Establishment of procedures for executing the work.

3. Inspecting all subgrade preparation prior to concrete application.

4. Inspection of work in progress to ensure that work is being done in accordance with established procedures; manufacturer's instructions; specific EOR instructions, if given; or recommended practices as given in the references in Para. 1.04.

5. Inspection of all work completed.

B. Qualifications:

1. The Contractor and its site superintendent shall have at least five years of experience supervising and performing the installation of similar concrete repairs and topping slabs.

C. Preinstallation Conference:

1. Attend a preinstallation conference to be held with a representative of the Owner, EOR, the Contractor's field superintendent, foreman, and other trades involved to discuss the conduct of the work of this Section.

D. The Owner's Testing Agency may conduct quality assurance tests during the work. Provide assistance and access to work areas for the Owner's Testing Agency as necessary.

1.09 GENERAL PROCEDURES

A. Work only in areas permitted by the Owner-approved schedule.

B. Remove all tools, buckets, and materials from work areas and store neatly at a central location daily at the end of work.

C. Deliver materials clearly marked with legible and intact labels with manufacturer's name and brand name and identifying contents of containers.

D. Store materials in areas where temperatures conform to manufacturer's recommendations and instructions.

E. Deliver, store, and handle steel reinforcement so as to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

F. Protect the building and its contents from all risks associated with the work in this Section. Schedule and execute all work without exposing adjacent building areas to water, dust, debris, or materials used by this Contractor. Protect adjacent areas from damage and stains with appropriate barriers and masking. Repair all damage as a result of the work of this Section to its condition at the start of work, or if such cannot be determined, to its original condition. Clean all stains by approved means.

G. Protect the work from damage such as impact, marring of the surfaces, and other damage.

H. Compliance with OSHA and all other safety laws and regulations is the exclusive responsibility of the Contractor, his Subcontractors, suppliers, consultants, and servants.

1.10 FOLLOWING CONSTRUCTION, THE CONDITION OF THE EXISTING TO REMAIN CONCRETE SIDEWALK SHOULD BE EQUAL TO IT'S CURRENT CONDITION AND SUBJECT TO THE OWNERS REVIEW AND APPROVAL.FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperatures are expected to fall below 40°F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms and steel reinforcement without forming standing water on the completed waterproofing just before placing concrete.

1.11 WARRANTY

A. Provide a Warranty for all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. Also, state that the Contractor shall bear all costs incurred by the Owner, including reasonable attorney's fees, to enforce compliance with the obligation of this Warranty. The obligation of this Warranty shall run directly to the Owner and may be enforced by the Owner against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this contract.

PART 2 – PRODUCTS

2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.

2. ACI 117.

2.02 GRAVEL BASE

A. Gravel Base: See specification Section 310000 – EARTHWORK.

2.03 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows.

a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 1 in. by 1 in., minimum.

C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and that does not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2.04 REINFORCEMENT

A. Not Used.

2.05 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source and from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150, Type II.

2. Fly Ash: ASTM C618, Class F.

C. Aggregate:

1. Normal-Weight Fine Aggregate: Shall be washed, inert, natural sand conforming to ASTM C33.

2. Normal-Weight Coarse Aggregate: Shall be well-graded crushed stone or washed gravel containing no deleterious substances and conforming to ASTM C33. Provide normal-weight coarse aggregate with a maximum size of 3/4 in.

a. Aggregate shall be nonreactive in the presence of alkalis in accordance with ASTM C1260 or ASTM C1293. Aggregates will be acceptable as non-deleteriously reactive if the aggregate produces ASTM C1567 expansion values of less than 0.1% at fourteen days using the same source material and relative proportions of cementitious materials proposed for use in the mix design.

D. Water: Mixing water for concrete shall be fresh, clean, and potable.

E. Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Air-Entraining Admixture: ASTM C260.

2. Shrinkage Reducing Admixture: Eclipse 4500 by Grace Concrete Products.

3. Water-Reducing Admixture: ASTM C494, Type A.

4. High-Range Water-Reducing Admixture: ASTM C494, Type F or Type G.

5. Water-Reducing Accelerating Admixture: ASTM C494, Type E.

6. Water-Reducing Retarding Admixture: ASTM C494, Type D.

7. Corrosion Inhibitor: ASTM C494, Type C.

2.06 CURING MATERIALS

A. Integral Concrete Curing Compound and Silane Sealer: One of the following, or approved equivalent:

1. CureShield EX, SpecChem LLC, 1511 Baltimore Ave, Suite 600, Kansas City, Missouri 64108

2. Iso-Cure 8525, KreteTek Industries Inc., 66 River Road, Hudson, New Hampshire 02051

3. Silencure, ChemMasters, 300 Edwards Street, Madison, Ohio 44057

2.07 PROPORTIONING AND DESIGNING MIXES

A. Submit written reports to the EOR of each proposed mix for each class of concrete at least fifteen days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by the Engineer of Record.

B. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301 and ACI 318. For the trial batch method, use an independent testing agency acceptable to EOR for preparing and reporting proposed mix designs.

1. Do not use the same testing agency for field quality control testing.

2. Limit use of fly ash to not exceed 25% of cementitious materials content by weight.

3. Limit use of slag to not exceed 50% of cementitious materials by weight.

4. Limit use of supplementary cementitious to not exceed 50% of cementitious materials content by weight.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15% by weight of cement.

D. Design mixes to provide normal-weight concrete with the following properties as indicated on Drawings and schedules:

1. Cement Content: 705 lbs per cubic yard, maximum. If a low-alkali cement is used to address potential aggregate reactivity, its effectiveness shall be demonstrated by testing according to ASTM C1567 or ASTM C1293.

2. Twenty-Eight-Day Compressive Strength: 5,000 psi.

3. Water-to-Cement Ratio: 0.40 maximum.

4. Air Content: Total 6% with a tolerance of ± 1-1/2% (4.5% to 7.5%) based on 3/4 in. aggregate. If other coarse-aggregate size is used, the air content will

need to be adjusted to meet minimum air contents as identified in ACI 318 for severe exposure.

5. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement not more than 7 in. at the point of placement after the addition of any high-range water reducers.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by EOR. Laboratory test data for revised mix design and strength results must be submitted to and accepted by EOR before using in Work.

F. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2. Use accelerating admixture in concrete slabs placed at ambient temperatures below 40°F.

3. Use water-reducing and water-retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

4. Use high-range water-reducing admixture in pumped concrete and concrete with water-to-cement ratios below 0.45.

5. Use air-entraining admixture in all concrete unless otherwise indicated.

2.08 CONCRETE MIXING

A. Ready-Mixed Concrete: All concrete shall be ready-mixed, complying with requirements of ASTM C94 and as specified. Furnish batch ticket information.

1. When air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hrs to 75 min., and when air temperature is above 90°F, reduce mixing and delivery time to 60 min. Concrete exceeding the delivery time shall be rejected.

PART 3 – EXECUTION

3.01 PROTECTION

A. All existing areas shall be protected from construction operations, including, but not limited to, the following:

1. Barricades shall be placed between all work areas and adjacent public areas.

2. Plywood shall be placed over any new concrete area that is used as work or staging area.

3. Water runoff shall be controlled to prevent staining of nonconstruction areas or automobiles.

3.02 COMPACTION

A. Compaction: See specification Section 310000 – EARTHWORK.

3.03 FORMWORK INSTALLATION

A. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

B. Construct forms tight enough to prevent loss of concrete mortar.

C. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.

1. Install keyways, reglets, recesses, and the like for easy removal.

2. Do not use rust-stained steel form-facing material.

D. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

E. Do not chamfer exterior corners and edges of permanently exposed concrete unless otherwise noted.

F. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

G. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

H. Before placing concrete, remove dust and debris from within the forms.

3.04 PLACING OF REINFORCEMENT

A. Not applicable.

3.05 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by EOR.

1. Install joint filler in accordance with manufacturer's recommendations.

C. Control Joints: Form weakened-plane control joints, sectioning concrete areas as indicated. Construct control joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 3/16 in. wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

a. Joints shall be cut 4 to 12 hrs after concrete placement.

b. Install joint filler in accordance with manufacturer's recommendations.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork is complete and that required inspections are completed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by EOR.

C. Deposit and consolidate concrete for slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Screed slab surfaces with a straightedge and strike off to correct elevations.

3. Slope surfaces uniformly, as indicated.

4. The minimum thickness of the new concrete slab shall not be less than 4 in.

5. Begin initial floating using bull floats or darbies using minimum number of passes required to form a uniform and open-textured surface plane before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.07 FINISHING SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Do not steel trowel the concrete.

B. The Contractor must install temporary elevation grade "stakes" (rebar doweled into slab) to establish final top-of-slab elevation. The stakes must be of sufficient quantity and spacing to provide a uniform repair profile and are to be removed after initial screeding.

C. Float Finish: Consolidate surface by hand floating. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture. Do not steel trowel the concrete.

1. Finish surfaces to the following tolerances:

a. Construct concrete surfaces within 1/4 in. of the indicated elevation, and deviating not more than 1/8 in. from a 10 ft straightedge placed anywhere on the surface. Additionally, under no circumstances are concrete surfaces to exceed the limitations in the applicable accessibility regulations.

D. Broom Finish:

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with EOR before application.

3.08 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 ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb per sq ft x hr 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. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure all unformed surfaces.

D. Cure concrete by applying Integral Concrete Curing Compound and Silane Sealer following manufacturer's recommendations immediately after finishing is complete.

3.09 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least twenty-eight days, or longer as recommended by manufacturer. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 in. deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by EOR. Remove and replace concrete that cannot be repaired and patched to EOR's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 in. in any dimension to solid concrete. Limit cut depth to 3/4 in. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding grout. Fill and compact with patching mortar before bonding grout has dried. Fill form-tie voids with patching mortar.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by EOR.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high

areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 in. wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least fourteen days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 in. to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

5. Repair defective areas, except random cracks and single holes 1 in. or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4 in. clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding grout. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

6. Repair random cracks and single holes 1 in. or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding grout. Place patching mortar before bonding grout has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hrs.

E. Repair materials and installation not specified above may be used, subject to EOR's approval.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform tests and inspections and to submit reports.

B. Inspections:

1. Verification of use of required design mixture.

2. Concrete placement, including conveying and depositing.

3. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu yd, but less than 25 cu yd, plus one set for each additional 50 cu yd or fraction thereof.

    a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40°F and below or 80°F and above, and one test for each composite sample.

5. Compression Test Specimen: ASTM C31; one set of five standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for standard-cured test specimens. Provide field storage curing facility and monitor temperature per ASTM C31. Place cylinders in final curing conditions meeting the requirements of ASTM C511.

6. Compressive-Strength Tests: ASTM C39; one set for each day's pour exceeding 5 cu yd plus additional sets for each 50 cu yd more than the first 25 cu yd of each concrete class placed in any one day; one specimen tested at seven days, three specimens tested at twenty-eight days, and one specimen retained in reserve for later testing if required.

7. Strength of each concrete mixture will be satisfactory if every average of any threeconsecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

8. Test results will be reported in writing to the Owner, EOR, Ready-Mix Producer, and Contractor within 24 hrs after tests. Include the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at twenty-eight days, concrete mix proportions and materials, compressive breaking strength, and type of break for both seven-day tests and twenty-eight-day tests.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by EOR but will not be used as sole basis for approval or rejection of concrete.

10. Additional Tests: Independent testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by EOR. Independent testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by EOR.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for existing work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 075419

POLYVINYL CHLORIDE (PVC) ROOFING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.

B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.

C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY: BASE BID

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

B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.

C. On a Lump-Sum Basis, provide the following roofing replacement as described below at each roof location:

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

a. Existing PVC membrane roofing system is recently installed and under manufacturer's warranty. Contractor is required to match all systems and materials, and coordinate work to maintain current warranty. Current PVC Membrane is consisting of (from bottom to top): Existing gypsum plank and lightweight concrete topping, adhered vapor retarder membrane, insulation including tapered insulation to provide slope-to-drain, fastened to the gypsum deck, cover board adhered to insulation, PVC roofing membrane adhered with heat-welded seams. Provide PVC flashing membrane at roof penetrations.

b. Provide new overflow roof drains at locations shown on drawing, adjacent to existing roof drains. Remove existing and provide new

roof membrane system, flashing, and insulation in order to install new overflow roof drains and restore roof membrane at existing roof drains affected by new work.. At existing roof drains remove and reinstall clamping rings, and strainers; existing drain bowls to remain.

c. Provide membrane liner at existing drain leader pipe, at locations as determined by field inspection.

d. Remove and re-install roof walkway pads at locations where disturbed by new work.

1.03 ADD ALTERNATES

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

B. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.

1.04 COORDINATE WITH RELATED WORK

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

1. Section 013300 – Submittal Procedures.

2. Section 014000 – Quality Requirements.

3. Section 015000 – Temporary Facilities and Controls.

4. Section 015700 – Temporary Controls.

1.05 REFERENCE STANDARDS

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

1. Connecticut State Building Code, current edition.

2. Secretary of the Interior's Standards for the Treatment of Historic Properties.

3. Product manufacturer's written recommendations.

4. ASTM International (ASTM): Standards as specified or referenced herein.

5. FM Global Applicable Publications (most current versions), including, but not limited to:

    a. FM Data Sheet 1-49 Perimeter Flashing.

    b. FM Data Sheet 1-28 Design Wind Loads.

    c. FM Data Sheet 1-29 Roof Deck Securement and Above-Deck Roof Components.

    d. FM Data Sheet 1-52 Field Verification of Roof Wind Uplift Resistance.

6. National Roofing Contractors Association (NRCA): NRCA Roofing Manual, current edition.

1.06 SUBMITTALS

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

1. Product Data:

    a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.

    b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.

    c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.

2. Existing Conditions Survey: Perform a survey of the existing roof deck at LS1 to measure the relative high and low points of the existing roof deck. Take measurements in general in a 10 ft by 10 ft grid, with additional measurements taken at areas of unusual geometry or where localized high or low points are apparent.

3. Shop Drawings: Provide shop drawings consisting of roof plans and details as follows:

a. Provide a roof plan showing the tapered insulation layout including roof slope, sumps around drains, and note associated flashing heights. Roof plan must also show roof drains and scupper locations.

b. Provide details of all PVC flashing showing exact profile, lengths, joints, terminations, and methods of attachment.

c. Show proposed layout of walkway pads.

d. Coordinate with other trades to show the work from other trades on the roofing shop drawings (e.g., sheet metal, rough carpentry, etc.).

4. Samples: Provide the following samples:

a. Of the materials specified herein or proposed for use in this project at the request of the Engineer.

5. Results of fastener pull-out tests for mechanical attachment into gypsum plank deck. Submit results for a minimum of ten fastener pull tests.

6. Cover Board Weigh-Down Plan: Submit proposed methods (i.e., plan) for weighing down insulation boards into foam adhesive during installation. Plan shall note type and frequency of weights to be utilized on each standard-size board for the project. Buckets of adhesive and rolls of stock shall not be utilized as hold-down weights, as contents of buckets can be removed and rolls of stock depleted, thus providing diminishing hold-down capacity as the work progresses. Weights shall be products/materials that are not intended to be incorporated into the roofing system.

7. Copy of installer's warranty as described herein.

8. Copy of manufacturer's warranty as described herein.

1.07 MOCKUPS

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

1. Roofing system, at roof drain addition, as directed.

1.08 PROTECTION, HANDLING, AND STORAGE

A. Refer to Section 014000 - Quality Requirements.

1.09 QUALITY CONTROL AND ASSURANCE

A. Refer to Para. 1.07 in Section 014000 – Quality Requirements.

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

C. Manufacturer's Field Representative: The Contractor shall arrange with the roofing manufacturer to have the services of a competent field representative at the site to approve surface preparation before installation of roofing materials and to be present to periodically observe the work in progress. The contractor shall coordinate with the roofing manufacturer to arrange as many site visits as required by the manufacturer for their warranty requirements. During site visits, the Field Representative shall instruct the crew on proper installation of materials and observe the installation of the roofing membrane. The Field Representative shall issue written reports of his/her findings and recommendations to the Owner and Engineer.

1.10 FIELD TESTING

A. Conduct (or arrange for) fastener pull-out tests to be performed on fasteners installed in the existing gypsum plank roof deck and new and existing plywood sheathing. Submit the results of the fastener pull-out tests to the Engineer for approval in advance of the work for each roof. Conduct a minimum of ten tests on each fastener type proposed for use on the project on each roof. Make all necessary temporary openings and repairs needed to perform the tests.

B. Weld Tests: Cut out and patch seam weld tests daily, or more frequently if required by the manufacturer or if requested by the Engineer.

1. Make test cuts 1 in. wide and longer than the width of the seam.

2. Allow the sample to cool for about 30 min., peel the sample apart, and examine the weld. The membrane should delaminate from the reinforcement. Machine welds shall be 1-1/2 in. wide; hand welds 2 in. wide.

3. If the samples do not meet the width minimum requirements or are deficient, the contractor must strip in ALL seams in the workday affected by the deficient welds.

4. Repair test-cut areas with membrane overlay with rounded corners and 2 in. hand-welded seam.

1.11 PERFORMANCE REQUIREMENTS

A. The roofing system, in combination with adjacent construction, shall provide a fully watertight system.

B. Design is in accordance with the Connecticut State Building Code, Current Edition, and must resist wind-uplift loads equal or greater than the following, with a factor of safety of 2 or greater:

1. Roof LS1:

a. Zone 1 (Field Wind Uplift Zone of Roof): 34 psf

b. Zone 2 (Perimeter Wind Uplift Zone of Roof): 56 psf

c. Zone 3 (Corner Wind Uplift Zone of Roof): 85 psf

d. Zone 3 (Corner Wind Uplift Zone of Roof): 67 psf

1.12 WARRANTY

A. Provide the roofing system manufacturer's twenty year warranty on all labor and materials on the roofing system as part of the Pricing Set. The roof warranty shall cover wind speeds up to and including 60 mph.

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

PART 2 – PRODUCTS

2.01 MANUFACTURERS

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

2.02 MATERIALS

A. PVC sheet roofing system and all associated flashings and accessories are to be produced by Sika Sarnafil, no exceptions, as required to be eligible for the manufacturer's warranty and to meet the specified wind-uplift-resistance requirements.

1. Vapor Retarder/Temporary Roof: Self-adhered sheet vapor retarder, 32 mil thick, composed of SBS-modified bitumen and polyethylene woven composite facer, Sarnavap-Self Adhered with 0.017 perm. Provide two layers with staggered joints.

a. Primer for Vapor Retarder/Temporary Roof: Solvent-based primer for use on concrete and wood decks, Sarnavap self-adhered primer by Sika Sarnafil.

2. PVC Roofing Membrane: Virgin PVC with plasticizers and other modifiers, formed into flexible sheets with nonwoven polyester reinforcing conforming to ASTM D4434, Type III, Sarnafil G410 with lacquer coating, 60 mils thick; color to be light gray.

a. Adhesive: Solvent-based, VOC-compliant, elastomeric adhesive, Sarnacol 2170 VC Adhesive.

3. PVC Flashing Sheet: Glass-fiber-reinforced PVC, asphalt-resistant membrane, Sarnafil G459; color to be light gray.

4. Accessories:

a. Circular Membrane Patch for Use at T-joints: Sanacircle – "G," 0.048 in. thickness by Sika Sarnafil.

b. PVC Prefabricated Boot Flashing: By Sika Sarnafil

c. PVC Prefabricated Corner Reinforcements: Sarnacorner Universal by Sika Sarnafil.

d. Batten Bars: Sarnastop by Sarnafil.

e. Termination Bar: 14 ga stainless steel metal bar, 1 in. wide, prepunched bar stock, Sarnabar by Sarnafil.

f. PVC Cord: 5/32 in. diameter PVC cord for use at the termination bars, Sarnacord PVC by Sarnafil.

g. Waterstop: One-part urethane, Sikaflex 1A, by Sika Sarnafil.

h. Membrane Cleaner: As recommended by Sika Sarnafil for cleaning surface of PVC membrane at area of hot-air welds.

B. Insulation: Rigid glass-fiber-faced isocyanurate foam insulation boards. Do not use boards more than 2 in. thick. Minimum compressive strength of 25 psi. Thickness as required to provide a minimum R value of R-30.

C. Tapered Edge Strips: 1-5/8 in. x 18 in. wedge-type fiberboard insulation, ASTM C208, surface sized.

D. Tapered Insulation: Isocyanurate insulation with fiberglass-reinforced facers. Minimum compressive strength of 25 psi, tapered at 1/4 in. per ft.

E. Cover Board: high-density polyisocyanurate roof board. Sarnatherm Roof Board H or approved equal.

1. Adhesive: Two-component foamable polyurethane board adhesive, Sarnacol OM Board Adhesive.

F. Stress Plate for Anchoring Insulation and Cover Board to Roof Deck: Sarnaplate – HD/CD by Sarnafil.

1. Fasteners for Concrete and Wood Decks: Sarnafastener – HD, length as required to ensure minimum 1 in. embedment into the existing lightweight concrete deck and full depth into plywood.

G. Fasteners (for attaching to wood blocking): Stainless steel annular ring nails in gauges as detailed or required, with length to provide a minimum of 1-1/4 in. embedment into the final piece receiving the nail points, except full depth into plywood.

H. Batt Insulation (at existing voids such as pipe penetrations, drain bowls, etc.): Mineral wool, Comfortbatt by Rockwool or approved equal.

I. Walkway Pads: PVC walkway pads 1/4 in. thick with raised nibs provided by roofing system manufacturer.

J. Hose Clamp: Stainless steel with worm drive, sized to fit penetration.

K. Sealant: Sealant recommended by Sika Sarnafil for use with PVC roofing system.

L. Drain liner: Epoxy pipe lining, applied as a fluid that hardens for form a continuous watertight solid liner; acceptable for use with cast iron pipes of storm drainage system, thickness to not exceed 7% of inner diameter of the pipe.

M. Sealant for setting PVC sleeve at scupper drains: One-part polyurethane sealant designed to be used compression-type seal and compatible with PVC membrane: Sikaflex-1a by Sika.

PART 3 – EXECUTION

3.01 INSPECTION

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

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

C. Perform demolition and preparation work carefully to avoid damage to the roof decks and flashing substrates.

D. Roof deck surface must be dry, clean, smooth, and intact. Do not start work until the deck surface and blocking are satisfactory for the roof installation.

E. Inspect existing roof deck for damage.

1. Coordinate with all relevant Specification Sections.

F. Verify that all existing roof drain lines are unblocked before starting work and report blockages to the Engineer in writing.

G. Coordinate work to drain leaders with plumbing work prior to starting roofing work.

3.02 PROTECTION

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

3.03 GENERAL WORKMANSHIP

A. The roofing system and workmanship shall be in accordance with the roofing system manufacturer's most-recent recommendations and specifications and shall be in accordance with the recommendations of the NRCA Roofing and Waterproofing Handbook, latest edition, except as modified herein.

B. Remove only as much of the existing roofing as can be replaced and made watertight during the same workday. Dispose of all rubbish in a legal manner off the site. Conduct debris to trucks or approved containers on the ground; do not throw debris from the roof. Use specific locations approved by the Owner for debris collection. Do not block building access at collection locations. Do not stockpile material on the roof.

C. If any unusual condition (such as deteriorated deck) is discovered, stop work and promptly report this finding to the Engineer.

D. Cover all exposed insulation each day and arrange work so that materials are not exposed to moisture at any time. Temporarily seal all edges of sheets not completed to the existing work daily. If asphaltic materials are used, completely remove these temporary connections before continuing with the work. At no time shall asphaltic materials be in contact with any PVC materials of permanent installation.

E. Upon completion of the work, arrange for the manufacturer to inspect the work; provide written report of their findings.

F. Allow deck surface to dry; if necessary, dry deck surface by artificial means approved in advance by the Engineer. Use electric dryers, portable blowers, or compressed air, but no open-flame dryers.

G. Sweep deck clean of all debris and foreign matter.

H. Maintain roof temporary seals (tie-offs) throughout the course of the work. All seams shall be heat-welded before leaving the jobsite that day. Replace damaged or wet new roofing or insulation at no additional cost to the Owner. If water infiltrates under the new roof membrane, the membrane and insulation will be considered damaged.

I. Do not work in temperatures below 40°F, unless specifically allowed by the Engineer. Comply with applicable recommendations by manufacturers of all materials for workmanship and handling, except as modified in this Section.

J. Apply all components of the roofing assembly in a single working day, including insulation, membranes, and flashing. Phasing of roofing in any form is not permitted.

K. Do not allow wrappers and packaging materials to be included in the roofing system.

L. Avoid exposure of any roofing components to rain, dew, or water of any kind. If rain threatens during the day, in an emergency, and at the end of each day, protect the unfinished exposed roofing and flashing components using water cutoffs at all open edges. Install cutoffs from the new roofing to the deck and to the adjacent existing roofing. Remove cutoffs completely, before proceeding with subsequent work.

M. Keep a full fire extinguisher within reach during all roofing operations. Keep only full fire extinguishers on site; promptly remove discharged or partially full extinguishers.

N. Ensure that all workmen and all others that walk on roofing wear clean, soft-soled shoes so as not to damage materials. Use equipment that has no sharp edges and is clean and free of any asphaltic and coal-tar products.

O. Lay out work to minimize construction traffic over installed materials.

P. Comply with all location clean air laws and regulations.

3.04 INSTALLATION OF VAPOR RETARDER

A. Install approved vapor retarder over prepared roof deck in accordance with the manufacturer's recommendations, and as determined by successful adhesion test, in locations indicated on the Drawings.

B. Prepare the concrete or wood deck and conduct successful nondestructive concrete or wood moisture tests as required prior to installation. Provide smooth transitions and eliminate loose materials and sharp protrusions. Broom deck surface clean. Remove dust and debris.

C. Install primer on clean, dry deck. Shake well before using. Apply with a brush, roller, or sprayer. Apply at manufacturer's recommended rate for the substrate. Allow primer to dry prior to installing vapor retarder. Do not use primer at membrane laps.

D. Vapor retarder must be installed over primer on the same day.

E. Begin vapor retarder installation at the drains and work toward the perimeter of the roof.

F. Lap all edges of the vapor retarder 4 in. minimum and all ends 6 in. minimum. Stagger joints minimum 12 in.

G. Install vapor retarder to achieve bond with the substrate. Roll all air bubbles out from the membrane.

H. Repair tears, voids, and lapped seams in vapor retarder not complying with requirements. Slit and flatten all fishmouths and any blisters greater than 1 in. in

diameter. Patch with sheet of vapor retarder extending 6 in. beyond repaired areas in all directions.

I. Turn up vapor retarder a minimum of 3 in. at all penetrations and walls as shown on the Drawings.

3.05 INSTALLATION OF INSULATION AND COVER BOARD

A. Install all insulation and cover board to achieve complete and permanent attachment between all insulation surfaces, the structural roof deck, and the roofing system.

B. Fasten insulation with approved fasteners at spacing recommended by the manufacturer to resist the specified wind-uplift loads, and as required based on results of fastener pull-out testing. For installation into gypsum plank deck, drill pilot holes through insulation and into deck 1/2 in. deeper than required embedment. Use care not to overdrive fastener and cause damage to insulation when installing fastener.

1. Roof LS1

a. Field Wind Uplift Zone: Minimum of 8 fasteners per 4 ft x 8 ft board.

b. Perimeter Wind Uplift Zone: Minimum of 8 fasteners per 4 ft x 8 ft board.

c. Corner Wind Uplift Zone: Minimum of 11 fasteners per 4 ft x 8 ft board.

d. Additional fasteners may be required to meet wind-load requirements based on results of fastener pull tests. Number of fasteners required calculated based on assumed 400 lb pull-out values for the concrete deck.

C. Adhere cover board using specified adhesive applied in accordance with wind uplift rating requirements and associated ribbon spacing patterns. Do not adhere boards larger than 4 ft by 8 ft or smaller than 2 ft in any direction.

1. Do not apply adhesive during inclement weather or to wet or damp surfaces. Do not apply adhesive if surface and/or ambient temperatures are outside of the manufacturer’s recommended range.

2. Place cover board into the adhesive shortly after it has reached its maximum rise (typically within 2 min.). Walk and roll boards into place using a 150 lb roller and weigh the boards down until the adhesive sets (generally within 7 min.). Do not use buckets of adhesive to weigh boards down.

D. Offset parallel insulation and cover board joints between and within each layer at least 6 in.

E. Arrange insulation board staggers at the end of each day's work to provide continuity of staggered joints between adjacent work areas.

F. Install tapered insulation, sumps, and crickets to provide slope-to-drain as shown on the approved Shop Drawings. Provide tapered insulation systems as required to create adequate slope-to-drain and prevent ponding on finished roof surfaces, neatly metered at corners, and trimmed as necessary for smooth surface transitions. Provide crickets behind all obstructions to flow toward drains.

G. Do not use pieces of insulation smaller than 18 in. in length or width. Neatly fill any open joints in the insulation more than 1/8 in. in width with matching materials.

H. Score cover boards at all changes in plane of the tapered insulation. Cover boards must remain attached and follow the contour of the tapered insulation below.

3.06 PVC MEMBRANE INSTALLATION

A. Follow the membrane manufacturer's written directions to install and adhere membrane roofing system except as modified in this Section. Sarnafil G410 must be installed by a Sika-Sarnafil Authorized Applicator.

B. Use the maximum size of all sheet materials to reduce the number of joints in the system. Position sheets to minimize number of seams and provide for 4 in. overlaps and end laps. Stagger end laps 12 in. minimum. Allow sheets to relax a minimum of 30 min. before bonding or attachment.

C. Place membrane panel, starting at the low point of the roof; unroll and allow to relax for a minimum of 30 min. before attaching or splicing. Position sheet so that each preceding sheet is lapped a minimum of 3 in. Position laps so that water runs across or parallel. Do not make seams that buck water. Orient sheets parallel to each other.

D. The membrane shall be adhered with the approved adhesive. Follow all manufacturer's installation instructions and recommendations for application of the adhesive and installation of the PVC membrane. Pay particular attention to weather and temperature restrictions.

E. At the base of walls and curbs install termination bars with the specified fasteners and recommended spacing. Fasteners shall clamp the membrane tightly to the substrate.

1. Heat-weld PVC cord to the PVC membrane on the outside of the termination bar.

3.07 PVC MEMBRANE SEAM CONSTRUCTION

A. Minimum width of seams is 4 in. for hand welding and 3 in. for machine welding.

B. Heat-weld seams per manufacturer's installation instructions. Use manufacturer-approved electric hot-air-welding devices to provide continuous watertight seals. All welds must be constructed by skilled mechanics trained in the welding procedure by the manufacturer.

C. Sweep the mating surfaces of the membrane at the seams with a stiff broom to remove any debris or dirt that may have accumulated. If required, wash membrane with cleaner recommended by the manufacturer and allow it to dry.

D. Whenever possible, all field splices on the horizontal surface (including flashing) should be completed using an automatic heat welder that has been designed for hot-air welding of thermoplastic membranes. Seams made with the automatic welder must be a minimum of 1-1/2 in. wide.

1. The air intake, temperature, and speed of the machine must be adjusted to provide proper seam strength.

2. An ample power supply must be provided to all heat-welding equipment. Provide a generator dedicated to the heat-welding equipment.

3. When weather conditions vary, adjustments to the welding machine must be made. Conduct test welds on spare material prior to beginning the finished product sheet.

E. Handheld welders shall only be used on vertical welds, or where an automatic welder is not practical or cannot be used. Seams made with handheld welders must be a minimum of 2 in. wide. Use silicone hand rollers to ensure proper mating of surfaces as heat-welding proceeds.

F. Cover T-joints with a circular patch of PVC membrane centered on the joint.

G. All heat-welded seams are to be tested for conformity by running a seam probe along the joint after the heat-weld has cooled. Any discontinuities shall be re-welded or patched. Positive evidence of welding is a characteristic uninterrupted extrusion of melted black material from the joint.

H. On-site evaluation of welded seams shall be made daily by the Contractor in locations as directed by the Owner, the Engineer, or the Owner's Representative. 2 in. wide cross-section samples shall be taken through completed seams. Correct field welds will fail from shearing of the membrane prior to separation of the weld. Patch all areas of test cuts at no additional cost to the Owner.

3.08 PVC MEMBRANE FLASHING CONSTRUCTION

A. PVC flashing system construction to be similar to, and with the same requirements as, the PVC roof system. Proceed with flashings as the roof membrane is completed to ensure positive waterproof protection at all projections from the roof. Comply with the manufacturer's written instructions except as modified herein.

B. Surfaces to be flashed must be clean, dry, and smooth.

C. Provide termination bars at the top termination of the membrane and at the perimeter of the roof and large roof openings. Secure the termination bars to the substrate with specified fasteners at 6 in. o.c. Allow a 1/4 in. gap at bar ends for expansion.

D. Bond flashing to substrates and field membrane using substrate adhesive following the manufacturer's written directions for application, method, and coverage rates. Fold the flashing onto the prepared substrate to eliminate wrinkles, folds, and nonbonded areas. Provide minimum 6 in. wide heat-welded seams beyond the peel stop.

E. Extend flashing onto the tops of the roof curbs and 3 in. onto the exterior vertical surface of the curb. Tack outside edge of flashing sheet in place with specified fastener at 6 in. o.c. Extend flashing 12 in. minimum onto field sheet beyond the termination bar and fully adhere the flashing sheet to the plywood at the inside face of the wall.

F. Fasten to top of curb and wall flashing with specified fasteners 6 in. o.c. minimum. Seal the top edge of vertical flashing with Water Cut-Off Mastic and secure the membrane as shown on the approved shop drawings.

G. At the base of building walls, extend the flashing sheet 12 in. minimum onto the field sheet beyond the termination bar and fully adhere the flashing sheet to the plywood at the inside face of the wall, terminating the sheet immediately below the metal flashing. Fasten the top edge of sheet with the specified fastener at 6 in. o.c.

H. Flash penetrations with the manufacturer's premolded pipe flashings where shown. Do not cut or patch premolded pipe flashings to assist in their installation. Verify that the premolded flashings will provide the specified flashing height. Seal top edge of pipe flashing with sealant and stainless steel hose clamp.

3.09 FLASHING AT DRAINS

A. Lay out work so that no laps come within 6 in. of the drain.

B. Clean drain parts of all traces of existing bitumen, dust, dirt, sealants, or other construction materials or contaminants prior to installing the roofing membrane.

C. Position the membrane and cut a hole for the roof drain allowing 1/2 in. to 3/4 in. of membrane inside the clamping ring and extending 18 in. beyond the drain in the field, and full height at the walls and curb. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.

D. Fully coat the drain-bowl clamping edge with sealant and press the edge of the flashing sheet into sealant. Ensure complete and continuous bond of the sheet to the edge of the drain. Use asphalt-compatible PVC membrane at the drains.

E. Install Water Cut-Off Mastic on the clamping ring seat flange below the membrane. Use a minimum of one-half of a 10 oz tube for a 10 in. drain.

F. Set and tighten the drain clamping ring.

3.10 MEMBRANE REPAIRS

A. Repair a puncture in the membrane with like material. The repair must extend a minimum of 2 in. beyond the boundary of the affected area in all directions. Round all corners of the repair piece. A pinhole will require a minimum 4 in. x 4 in. patch.

B. Newly installed membrane shall be cleaned as described above for standard seaming details.

C. When repairing a membrane that has been in place for some time or has been subjected to dirt or contamination, it is necessary to remove accumulated field dirt. Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water and then rinsing with clear water and drying with clean cotton cloths. For membrane with a significant accumulation of dirt, cleaning with acetone and a clean cotton cloth may be required.

D. Heat weld the repair as described above for standard seaming details.

3.11 REPAIR OF EXISTING DRAIN LEADER

A. Inspect all existing drain lines to determine serviceability, report deficiencies to AHJ

B. If repair work is needed:

1. Clean existing drain line to remove all dirt, debris, and other materials that will inhibit the bond of the epoxy liner.

2. Scope drain line prior to application of liner to identify cracks, holes, and other deficiencies; document observed deficiencies on an elevation plan.

3. Apply and cure fluid-applied epoxy liner in accordance with the manufacturers' requirements and recommendations.

4. Following application and curing of epoxy liner, scope the drain line again focusing on areas of observed deficiencies to confirm all cracks, holes, and other defects are repaired; reapply epoxy liner and repeat scoping as necessary to provide a watertight drain leader.

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

3.12 REMOVAL AND REINSTALLATION OF ROOF-MOUNTED EQUIPMENT – AS DETERMINED BY INSPECTION OF EXISTING SITE CONDITONS.

A. Perform mechanical and electrical work using licensed mechanics, for necessary removal, storage, and reinstallation of rooftop equipment. Provide the Owner with minimum seven days' advanced notice of shutdowns and conform to scheduling requirements of the Owner. Coordinate with Propark for removal and reinstallation of security cameras.

B. Coordinate work to allow roofing reconstruction to proceed unimpeded, and replace mechanical equipment to reconnect electrical lines promptly after roofing work is complete.

C. Contractor's Superintendent shall be on site when equipment is being removed, replaced, and reinstalled on the roof.

D. Verify the operating condition of all mechanical equipment of rooftop units. Submit a written report to the Owner of the existing conditions. Restore operating condition of the equipment at the end of the Project.

E. Disconnect and tag all power wiring and control wiring on all rooftop units that are to be disconnected and reconnected. Leave all disconnected lines in a safe condition during the work.

F. Extend ducts and services to match existing, wherever needed to provide proper operation of all units that have been raised or relocated. Raise conduit and reroute wiring as required to reconnect fixtures.

G. Reinstall and reconnect all electrical power and control wiring.

H. Reinstall all mechanical work. Start up and verify the operating condition of all mechanical equipment that was disconnected and submit a written report to the Owner. Correct any deficiency that was not reported before removal, at no additional cost to the Owner.

3.13 CLEANUP

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

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for PVC Roofing work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 092216

NON-STRUCTURAL METAL FRAMING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.

B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.

C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY

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

B. Furnish and install:

1. Metal furring and framing where indicated on the Drawings, including cross bracing and knee bracing.

2. Metal framing for ceilings and soffits.

3. Reinforcing plate blocking.

4. Deflection track assemblies at tops of metal stud partitions.

5. Provide fire-rated assemblies at fire-rated, corridor, and smoke partitions.

6. Provide non-fire-rated assemblies at all other partitions.

C. Provide the shop drawings, field testing, submittals, and mockups as included in this Section.

1.03 ADD ALTERNATES

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

1.04 COORDINATE WITH RELATED WORK

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

1. Section 013300 – Submittals Procedures.

2. Section 014000 – Quality Requirements.

3. Section 015000 – Temporary Facilities and Controls.

4. Section 015700 – Temporary Controls.

5. Section 092900 – Gypsum Board: Gypsum board, applied over metal framing installed by this Section 092216 including: gypsum board, and related trim components.

1.05 REFERENCE STANDARDS

A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein. The standards referenced herein are included to establish recognized minimum quality only. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern. Equivalent quality and testing standards will be acceptable, subject to their timely submission, review and acceptance by the Architect.

1. Connecticut State Building Code, current edition.

2. Secretary of the Interior's Standards for the Treatment of Historic Properties.

3. Product manufacturer's written recommendations.

4. ASTM A568/A568M – Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

5. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

6. ASTM A641/A641M – Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire.

7. ASTM A1003/A1003M – Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

8. ASTM C636/C636M – Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

9. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.

10. ASTM C1002 – Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

11. ASTM C754 – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

12. ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

13. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

14. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

15. GA 203 – Installation of Screw-Type Steel Framing Members to Receive Gypsum board.

1.06 SUBMITTALS

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

1. Product Data:

a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.

b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.

c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced

standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.

2. Existing Conditions Survey: Perform a survey of the existing area of work.

3. Shop Drawings: Provide shop drawings consisting of plans and details as determined by owner and/or representative:

1.07 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work of this Section with the respective trades responsible for installing interfacing work, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work

2. Work of this Section shall be closely coordinated with the work of Section 092900 – Gypsum Board to assure the steady progress of the Contract.

1.08 PROTECTION, HANDLING, AND STORAGE

A. Refer to Para. 1.09 in Section 014000 – Quality Requirements.

1.09 QUALITY CONTROL AND ASSURANCE

A. Refer to Para. 1.07 in Section 014000 – Quality Requirements.

B. Contractor Qualifications: Contractor must have a minimum of ten years of experience with successfully completed projects on historic buildings. Provide a list of five projects or more showing at least ten years' successful experience with similar work on historic buildings. List the building name and address, the Owner's representative, the General Contractor, and the Engineer or Architect observing the work, with phone numbers and contact personnel. Acceptance of bid will depend upon firm's experience completing similar work on historic buildings and review of provided references. The foreman for this project must individually have at least 5 years' successful experience on similar work on historic buildings.

C. General: Notify the Architect where conflicts apply between referenced standards and existing materials, and existing methods of construction.

D. Seismic Compliance: Nonstructural components that are permanently attached to structures and their support attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance to local jurisdiction.

E. Sole Source: Obtain products required for the Work of this Section from a single manufacturer.

1.10 PERFORMANCE REQUIREMENTS

A. Design is in accordance with the Connecticut State Building Code, Current Edition.

1.11 WARRANTY

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

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:

1. Metal components and related items (including non-rated deflection track assemblies):

2. ClarkDietrich Building Systems, LLC, West Chester, OH.

3. EB Metals US, Londonderry NH.

4. Marino\Ware, Division of Ware Industries, South Plainfield NJ.

5. Cemco Steel Framing and Metal Lath, City of Industry, CA.

6. Telling Industries, Willoughby, OH.

7. Studco Building Systems US LLC, Webster, NY.

8. Super Stud Building Products, Inc., Edison NJ.

9. Fire rated deflection track assemblies:

10. Cemco Steel Framing and Metal Lath, City of Industry, CA.

11. ClarkDietrich Building Systems, LLC, West Chester, OH.

12. Delta Star, San Carlos, CA.

13. Fire Trak Inc., Watkins, MN.

14. Metal-Lite Inc., Crossville, TN

15. The Steel Network, Inc., Durham, NC.

2.02 DESCRIPTION

A. Regulatory Requirements

1. Obtain certificate of compliance from authority having jurisdiction indicating approval of specified products.

2. Fire resistance ratings: Where gypsum board systems with fire-resistance ratings are indicated, provide materials and assemblies of the rating required, tested per ASTM E119, which are identical to those indicated by reference to Gypsum Association file numbers in "Fire Resistance Design Manual" or to design designation in the Underwriters Laboratories "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction and to the Owners' insurance underwriters.

a. Fire-Test-Response Characteristics: Provide components that comply with rating requirements specified for fire-rated assemblies where required for non-load bearing wall systems .

b. Deflection Clips and Firestop Track: Connections and/or top runner provided in fire-resistance-rated assemblies shall be certified by UL 2079 for cyclic movement requirements

B. Sustainability Requirements: Recycled content of Steel: Use maximum available percentage of recycled steel. Steel framing products incorporated into the work shall contain not less than 30 percent of recycled steel.

2.03 FRAMING MATERIALS

A. “Hat-Shaped” Furring Channels: 7/8 in. deep and 1-1/2 in. deep as indicated on Drawings, roll-formed, hat-shaped, furring channel 25 ga (0.179 in. [0.45 mm]) minimum thickness hot dip galvanized steel galvanized steel conforming to ASTM C645.

B. Resilient furring channels (“RC1”): Roll-formed, single leg, hat-shaped, 1/2 x 2-5/8 in. with 1-1/2 in. screw flange. 25 ga hot-dip galvanized steel or G40EQ coating, conforming to ASTM C645, with pre-punched holes, equal to the following:

1. ClarkDietrich Building Systems, LLC, West Chester, OH, product “RC1 Delux.”

2. EB Metals US, Londonderry NH., product "RC1 Resilient Furring."

3. Marino\Ware, Division of Ware Industries, South Plainfield NJ., product "RC1."

4. Cemco Steel Framing and Metal Lath, City of Industry, CA., product "RC1."

5. Telling Industries, Willoughby, OH., product " RC-1"

6. Super Stud Building Products, Inc., Edison NJ., product "RC1."

7. USG Corporation, Chicago IL., product "RC1 Resilient Furring."

C. Furring channels: "Z shaped" depth as indicated on Drawings, roll-formed, 25 ga (0.179 in. [0.45 mm] minimum thickness), hot dip galvanized steel.

D. Studs: "C-shaped" screw studs, hot-dip galvanized steel complying to ASTM C645, 20 ga equivalent (nominal 0.02 in. [0.75 mm] factory ribbed and/or embossed for performance equivalent to 20 ga (0.0329 in. [0.84 mm] minimum thickness studs), of widths indicated on the Drawings.

1. Framing members shall have a G-40 (hot-dipped galvanized) minimum protective coating conforming to ASTM A653/A653M and ASTM A1003/A1003M (Table 1), or approved "G40EQ" equivalent coating.

2. Acceptable products include the following or approved equal:

a. ClarkDietrich Building Systems, LLC, product "ProStud20" series.

b. Marino\Ware, Division of Ware Industries, product: "ViperStud Viper20."

c. Cemco Steel Framing and Metal Lath, product; "ViperStud Viper20."

d. Telling Industries, product; "Supreme Stud."

e. Super Stud Building Products Inc., product: "Edge EQ, EDS20P."

3. Provide full 20 ga (0.0329 in. [0.84 mm] minimum thickness studs where required under the indicated UL assemblies to meet fire resistance ratings.

E. Runners for metal studs: 'U-shaped' hemmed, hot-dip galvanized steel track conforming to ASTM C645, of gage and width to match respective stud sizes, or heavier gage per design requirements, having 1-1/4 in. leg, provided at tops and bottoms of all studs and at heads of all openings in stud partitions.

F. Internal reinforcement for various stud conditions, and bracing as required: 10 ga, minimum, galvanized steel.

G. Furnish cross bracing and knee bracing, as required to assure a completely rigid assembly on metal stud partitions and furred areas.

2.04 CEILING AND SOFFIT FRAMING MATERIALS

A. Carrying channels, 2 in. deep, 16 ga cold-rolled channels, galvanized.

B. Support channels: 3/4 in. deep, 16 ga cold-rolled channels, galvanized.

C. Furring Channels: 7/8 x 2-3/4 in., roll-formed, hat-shaped, furring channel 25 ga hot-dip galvanized steel galvanized steel conforming to ASTM C645.

D. Metal studs used in soffit and ceiling framing: "C-shaped" screw studs, hot-dip galvanized steel complying to ASTM C645, 25 ga, of widths indicated on the Drawings, or other gages as required under the specified standards to meet fire resistance ratings.

2.05 ACCESSORIES

A. Metal sheet plate blocking and bracing, where indicated: galvanized sheet 0.0312 in. thickness (20 ga).

B. Fasteners:

1. Expansion-type fasteners for securing vertical concrete and masonry surfaces.

2. Concrete stub nails for securing runners to concrete.

3. Nº.7 by 7/16 in. pan head self-drilling screw to attach metal framing components.

C. Reinforcing plates for blocking: 20 ga cold rolled sheet steel, provide minimum 6 in. width, or as otherwise indicated on the drawings.

PART 3 – EXECUTION

3.01 INSTALLATION, QUALITY STANDARDS

A. General: Perform erection procedures for the various gypsum board system conditions, except as otherwise specified, as set forth in GA 201, GA 206, the written instructions of gypsum board manufacturer, together with the additional requirements specified herein and as indicated on the Drawings.

B. Wherever fire-resistive rated assemblies are indicated on the Drawings, erect gypsum board systems in strict accordance with the manufacturers' UL listed test constructions for the required fire rating on each specific assembly.

3.02 INSTALLATION OF FURRING

A. Install metal furring channel horizontally, with channels spaced not more than 16 in. on centers, and attaching the channels to the masonry or concrete substrates with expansion type fasteners spaced not more than 8 in. on centers. Shim beneath channels as needed to ensure that a uniform receiving plane is maintained throughout.

B. Install Z-channel furring vertically, coordinated with width of rigid insulation at 24 in. on centers, Attach Z-furring to the masonry and concrete substrates with expansion type fasteners spaced not more than 8 in. on centers. Shim beneath channels as needed to ensure that a uniform receiving plane of final finish is maintained throughout.

3.03 INSTALLATION OF PARTITION FRAMING

A. Install metal runners at floor and ceiling to structural elements with suitable fasteners located 2 in. from each end and intermediate fasteners spaced no greater than 24 in..

B. Install metal stud framing with open side facing in same direction, engaging floor and ceiling runners.

1. Stud spacing: Typical: 16 in. on-center.

2. When necessary to splice studs, nest stud with 8 in. overlap and screw studs together with screws on both flanges.

3. Where studs are installed directly to exterior masonry walls, install asphalt felt between stud and wall.

C. Install studs in direct contact with all door and window frame jambs, abutting partitions, partition corners and existing construction elements; screw fasten with screw through both flanges of studs and track, top and bottom.

D. Securely anchor studs to jamb and head anchors of steel door and window frames. Over head of frames and openings in partitions, install a horizontal section of runner with a web flange bent at each end, horizontally and secure to strut studs with two screws in each bent web. Provide cripple studs over wall openings.

E. Where horizontal studs are used for wall reinforcing or framing, cut pieces of stud and install horizontally between vertical studs. Cope horizontal studs to fit between flanges of vertical studs. Bend ends of horizontal studs or install clip angles in order to secure by screwing to vertical studs.

F. Furnish and install additional cross bracing and knee bracing and other framing elements, as required to assure a completely rigid assembly on metal stud partitions

and furred areas, whether or not such bracing has been indicated on the drawings, and for proper receipt of items which will be attached to partition surfaces.

3.04 INSTALLATION OF DEFLECTION TRACK

A. Isolate interior metal stud framing and shaft wall framing from building structure to prevent transfer of loading imposed by structural movement due to deflection.

1. Install deflection track top runner in accordance with manufacturer's instructions and as required to attain lateral support and avoid axial loading.

2. Install fire-rated deflection track top runner in accordance with manufacturer's instructions at top of fire-rated, corridor and smoke partitions.

3.05 INSTALLATION OF REINFORCING PLATE BLOCKING

A. Install steel reinforcing plates in partitions and furred walls for the support of wall mounted objects as follows:

1. Wherever such reinforcing plates are indicated on the drawings.

2. In lieu of scheduled wood blocking, except at door frames.

3. In locations where wall bumpers are to be installed for the protection of wall surfaces from swinging doors.

4. All wall-mounted objects and locations.

5. All markerboard and tackboard locations.

B. Secure gage sheet metal reinforcing plates to steel studs with 1-1/4 in., Type "S" bugle head screws.

3.06 INSTALLATION OF CEILING AND SOFFIT FRAMING

A. install framing to height indicated, independent of walls, columns, and above ceiling work. Erect after Work above ceiling is complete. Coordinate the location of hangers with other work.

B. Securely anchor hangers to structural members or embed in structural slab. Space hangers to achieve deflection limits indicated.

C. Space main carrying channels at maximum 48 in. centers; not more than 4 in. from wall surfaces. Lap splice securely.

D. Securely fix furring channels or metal studs to hangers to prevent turning or twisting and to transmitted full load to hangers.

1. Place furring channels perpendicular to carrying channels at 16 in. on center, not more 1 in. from perimeter walls and rigidly secure. Lap splice securely.

2. Screw fasten metal studs perpendicular to carrying channels at 16 in. on center, not more 1 in. from perimeter walls. Lap splice securely.

E. Reinforce openings in suspension system which interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 in. past each opening.

3.07 TOLERANCES

A. Install partition and ceiling framing and furring with a maximum variation from true flatness of 1/8 in. per 10 ft, noncumulative.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 092900

GYPSUM BOARD

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. The Contract Documents, including General Conditions, Bidding Requirements, and Drawings, apply to this Section.

B. Maintain a copy of all applicable drawings, including shop drawings, and specifications at the site during all work covered under this Section.

C. This property is listed on the National Register of Historic Places. All exterior work performed must be in conformance with these Specifications and Drawings, and must meet the Secretary of the Interior's Standard for the Treatment of Historic Properties.

1.02 SUMMARY:

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

B. Furnish and install:

1. Taped, compounded and sanded gypsum board finishes.

2. Impact-resistant gypsum board.

3. All trim and accessory components related to gypsum board work.

4. Acoustical joint sealant and backing at perimeter of gypsum board partitions.

C. Install access panels occurring in gypsum board work as required by trades and adjacent work.

1.03 ADD ALTERNATES

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

1.04 COORDINATE WITH RELATED WORK

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

1. Section 013300 –Procedures.

2. Section 014000 – Quality Requirements.

3. Section 015000 – Temporary Facilities and Controls.

4. Section 015700 – Temporary Controls.

5. Section 092216 – Non-Structural Metal Framing - Non-load bearing partition, ceiling and soffit framing and furring. Deflection track assemblies at tops of metal stud partitions.

1.05 REFERENCE STANDARDS

A. The following documents are a part of this Specification except as modified in the Technical Specifications, including the references contained in each document. Comply with all applicable Sections of the document and the referenced standards unless specifically modified herein. The standards referenced herein are included to establish recognized minimum quality only. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern. Equivalent quality and testing standards will be acceptable, subject to their timely submission, review and acceptance by the Architect.

1. Connecticut State Building Code, current edition.

2. Secretary of the Interior's Standards for the Treatment of Historic Properties.

3. Product manufacturer's written recommendations.

4. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

5. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.

6. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

7. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.

8. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

9. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

10. ASTM C1177/C1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

11. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel.

12. ASTM C1396/C1396M - Standard Specification for Gypsum Board.

13. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

14. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels.

15. ASTM C1766 - Standard Specification for Factory-Laminated Gypsum Panel Products.

16. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

17. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

18. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

19. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

20. GA 220 - Recommended Specifications for Gypsum Board Winter Related Job Problems.

21. GA 600 – Fire Resistance and Sound Control Design Manual.

22. The Gypsum Construction Handbook, (USG), Seventh Edition.

23. UL - Fire Resistance Directory.

24. UL 723 - Tests for Surface Burning Characteristics of Building Materials

B. Inclusionary References: The following reference materials are hereby made a part of this Section by reference thereto

1. GA 201 - Gypsum Board for Walls and Ceilings.

2. GA 214 - Recommended Specifications for Levels of Gypsum Board Finish, Glass Mat and Fiber-Reinforced Gypsum Panels.

3. GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.06 SUBMITTALS

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

1. Product Data:

a. Manufacturer's literature for all materials specified or proposed for use on the project, properly labeled and referenced to the appropriate Specification Section.

b. Safety Data Sheets (SDSs) for each material where appropriate. Submit to GHTD; do not submit to Engineer.

c. Certifications by the producer of each material that all materials supplied comply with all the requirements of the appropriate referenced standards, that all materials are compatible with adjacent materials, and that all materials are suitable for their intended purpose.

2. Existing Conditions Survey: Perform a survey of the existing area of work.

3. Shop Drawings: Provide shop drawings consisting of plans and details as determined by owner and/or representative:

1.07 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. General: Coordinate the work of this Section with the respective trades responsible for installing interfacing and adjoining work for proper sequence of installation, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

2. Work of this Section shall be closely coordinated with the work of Section 092216 - NON-STRUCTURAL METAL FRAMING, to assure the steady progress of the Contract.

1.08 DELIVERY, PROTECTION, HANDLING, AND STORAGE

A. Delivery and Acceptance Requirements:

1. Do not deliver items to the site, until all specified submittals have been submitted to, and approved by, the Architect.

2. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Storage and Handling Requirements:

1. Store materials inside, under cover, and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion, and damage from construction traffic and other causes.

a. Neatly stack board materials flat to prevent sagging.

2. Handle board materials so to prevent damage to edges, ends and surfaces.

3. Protect trim, accessories, and corner beads from being bent or damaged.

C. Refer to Div.1 Quality Control and Project Procedures.

1.09 SITE CONDITIONS

A. Environmental Conditions: In accordance with GA 216, maintain minimum ambient temperature of 50°F 48 hrs before, during taping and compounding, and until completely dry thereafter.

1.10 QUALITY CONTROL AND ASSURANCE

A. Refer to Div.1 Quality Control and Project Procedures.

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

C. General: Notify the Architect where conflicts apply between referenced standards and existing materials, and existing methods of construction.

D. Seismic Compliance: Nonstructural components that are permanently attached to structures and their support attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance to local jurisdiction.

E. Sole Source: Obtain products required for the Work of this Section from a single manufacturer.

1.11 WARRANTY

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

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:

1. Gypsum board products:

a. United States Gypsum Company, Chicago, Illinois (USG).

b. National Gypsum Company, Charlotte, North Carolina (Gold Bond and ProForm Brands).

c. G-P Gypsum Corporation, Atlanta, Georgia.

d. CertainTeed Saint-Gobain, Malvern, Pennsylvania.

2. Metal trim and accessories:

a. Bailey Metal Products Ltd., Ville Mont-Royal, Quebec, Canada.

b. ClarkDeidrich Metal Framing, Pittsburgh, Pennsylvania.

c. National Gypsum Company, Gold Bond Products Division, Charlotte, North Carolina (Gold Bond and ProForm brands).

d. United States Gypsum Company, Chicago, Illinois (USG).

3. Joint sealants:

a. Tremco, Beachwood, Ohio.

b. Pecora Corporation, Harleysville, Pennsylvania.

c. Owens Corning, Toledo, Ohio.

d. Specified Technologies, Inc. (STI), Somerville, New Jersey.

B. The design and details as shown on the Drawings and the model numbers specified herein are to establish the standards of design and quality and not to limit competition.

2.02 DESCRIPTION

A. Regulatory Requirements

1. Fire resistance ratings: Where gypsum board systems with fire-resistance ratings are indicated, provide materials and assemblies of the rating required, tested per ASTM E119, which are identical to those indicated by reference to Gypsum Association file numbers in "Fire Resistance Design Manual" or to design designation in the Underwriters Laboratories "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction and to the Owners' insurance underwriters.

2. Seismic Compliance: Nonstructural components that are permanently attached to structures and their support attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance to local jurisdiction.

2.03 BOARD MATERIALS

A. Impact-Resistant Gypsum Board (IRGB): UL type FRX fire resistance type, ASTM C1278 board, complying with ASTM C1658 and ASTM C1396/C1396M.

1. ASTM C1629 Test Result Characteristics, minimum Level ratings:

a. Abrasion: Level 3.

b. Indention: Level 1.

c. Soft Body Impact: Level 3.

d. Hard Body Impact: Level 2.

2. Acceptable products include the following or approved equal:

a. USG Sheetrock brand product "Mold-Tough VHI."

b. National Gypsum Company, Gold Bond brand product “Hi Impact XP.”

c. G-P Gypsum Corporation product, “Dense Armor Plus Impact.”

d. CertainTeed Saint-Gobain, product “Extreme Impact Resistant Drywall with M2Tech.”

2.04 TRIM AND EDGE COMPONENTS AND MATERIALS

A. Metal trim accessories:

1. Corner beads: 1-1/4 by 1-1/4 in. corner bead for finishing with joint compound fabricated from galvanized steel conforming with ASTM C1047. Acceptable products include the following or approved equal:

a. Bailey Metal Products Ltd., model D100.

b. ClarkDeidrich Metal Framing, model CBS.

c. GOLD_BOND Product 1-1/4 in. Wallboard Corner Bead.

d. USG product “Dur-A-Bead - number 103.”

2. Casing beads: Edge casing bead with 1/2 in. back leg, for finishing with joint compound fabricated from galvanized steel conforming with ASTM C1047. Acceptable products include the following or approved equal:

a. Bailey Metal Products Ltd., model D-200.

b. ClarkDeidrich Metal Framing, model M20B.

c. Gold Bond product, Wallboard Casing number 100.

d. USG product “Dur-A-Bead - number 200A”

3. Control joints: Solid zinc “V-shaped” control joint, having 3/32 in. thick perforated grounds. Acceptable products include the following or approved equal:

a. Bailey Metal Products Ltd., model ‘zinc control joint.’

b. ClarkDeidrich Metal Framing, Model 093.

c. Gold Bond Model 093 zinc.

d. USG product “Control Joint - number 093.”

B. Paper faced trim accessories for use with Abuse Resistant Gypsum Board:

1. Corner beads (at outside corners): Paper-faced galvanized steel sheet for finishing with joint compound conforming with ASTM C1047, equal USG product "Sheetrock" Brand Paper-Faced Metal Corner Bead.

a. Provide curved-edge cornerbead with notched or flexible flanges at curved openings.

2. Casing beads: Paper-faced galvanized steel sheet for finishing with joint compound conforming with ASTM C1047, equal to USG product "Sheetrock" Brand Paper-Faced Metal Beads and Trims.

a. LC-Bead (J-Bead): Use at exposed panel edges.

b. L-Bead: Use where indicated.

c. U-Bead: Use where indicated.

3. Control joints: Solid zinc "V-shaped control joint, having 3/32 in.thick perforated grounds, equal to USG Control Joint No. 093.

2.05 ACCESSORIES

A. Tapes and compound:

1. Joint tape (at paper-faced gypsum): nominal 2 in. wide, high strength, cross-fibered paper drywall tape.

2. Joint tape (at fiberglass faced gypsum): nominal 2 in. wide, self-adhering (adhesive backed), fiberglass mesh tape.

3. Joint compound for setting fiberglass joint tape:

A. Certainteed Saint-Gobain, Malvern, Pennsylvania, product "Prorock Moisture and Mold Resistant 90."

B. Georgia Pacific Gypsum LCC., Pittsburgh, Pennsylvania, product "Densarmor cote."

C. CTS Cement Manufacturing Corporation, Cypress, California, product "Rapid Set Onepass."

4. Joint compound for setting paper joint tape: 'speed-setting type compound,' field mixed. Acceptable products, or approved equal:

a. USG product "Durabond 20."

b. Proform brand product "Proform Quickset 20."

c. Georgia Pacific Gypsum LCC, product "Toughrock all-purpose dry mix."

5. Joint compound for finishing: field mixed joint compound or factory pre-mixed compound.

a. Field-mixed compounds: acceptable products, or approved equal:

(1) USG product "Durabond 90".

(2) Proform brand product "Proform Quickset 90".

(3) Georgia Pacific Gypsum LCC, product "Toughrock setting compound 90".

B. Factory pre-mixed compounds: acceptable products, or approved equal:

(1) Usg product "Ready-Mixed Joint Compound."

(2) Proform brand product "Proform All Purpose compound."

(3) Georgia Pacific Gypsum LCC, product "Toughrock Ready Mix All-Purpose Compound"

B. Fasteners (interior board systems):

1. Type S, bugle head screws complying with ASTM C1002, for applying gypsum board to metal framing, ceiling grid system, and furring channels.

A. Not less than 1 in. long for single layer gypsum board.

B. Not less than 1-5/8 in. [41mm] long for double-layer gypsum board.

C. Laminating adhesive: ready mix joint compounds as specified herein above

D. Joint sealers (acoustical sealant): one component acrylic latex, permanently elastic, non-staining, non-shrinking, non-migrating and paintable.

1. Acceptable products include the following, or approved equal.

A. Hilti Inc., Tulsa, Oklahoma, product: "CP506 - Smoke and Acoustic Sealant."

B. Owens Corning, product: "Quietzone Acoustical Sealant."

C. Pecora Corporation, Harleysville, Pennsylvania; product: "AC-20 FTR."

D. Specified Technologies, Inc. (STI), product: "Smoke 'n" Sound Acoustical Sealant."

E. Tremco, Beachwood, Ohio; product: "Acoustical Sealant."

2.06 SOURCE QUALITY CONTROL

A. Obtain gypsum board and finishing products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that all items which are to be enclosed by Work of this Section, have been permanently installed, inspected and approved.

B. Inspect framing and other substrates; verify that they are in proper condition to receive the work of this Section.

C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. During the operation of gypsum board work, protect all wood, metal, glass, flooring, and other finished materials against undue soilage and damage by the exercise of reasonable care and precautions. Repair or replace any work so damaged and soiled.

3.03 INSTALLATION – GENERAL

A. General: Perform erection procedures for the various gypsum board system conditions, except as otherwise specified, as set forth in GA 201, GA 216, GA 220, GA 600, and the written instructions of the gypsum board manufacturer, together with the additional requirements specified herein and as indicated on the Drawings.

B. Where fire-resistive rated assemblies are indicated, erect gypsum board systems in strict accordance with the manufacturers' UL listed test constructions for the required fire rating on each specific assembly.

1. At intersections of dissimilar wall types, gypsum wallboard assembly of the higher fire-resistant rating is to run through the intersection, maintaining required fire separation.

2. Fire-rated construction shall be continuous from floor deck to underside of floor deck above or to underside of roof deck as applicable, and as detailed.

3. Shaft wall construction shall be continuous from bottom of shaft wall to top of shaft wall without interruption, except where otherwise detailed on Drawings.

C. Install specified control joints where indicated on Drawings and where run of partitions, or furred surfaces exceeds 30 ft. Show locations of all control joints on shop drawings.

1. Locate control joints at corners of head frames of doors.

2. Run vertical control joints continuously to top of partition, shaft wall or furred area, as applicable.

3.04 INSTALLATION OF GYPSUM BOARD

A. Screw fasten only, gypsum board to framing and furring, with ends and edges occurring over firm bearing. At all door jambs screw fasten gypsum panels 8 in. on center to both box studs.

1. Erect single layer fire-resistance rated gypsum board vertically.

2. Erect standard and moisture-resistant layer board in most economical direction.

3. Erect ceiling and soffit gypsum boards to meet UL requirements, where applicable, stagger end joints over supports. Secure gypsum board with fasteners inserted through ceiling buttons; anchor fasteners directly to framing or suspended support system.

B. Wherever items penetrate the gypsum board surfaces, use extra care in cutting the gypsum board to ensure a uniformly dimensioned joint between the penetrating item and the gypsum board, and fill joints with specified sealant material. Verify the expected deflection factor of the penetrating members, and cut the gypsum accordingly, to prevent damage thereto from the deflecting members.

C. Installing Trim Accessories:

1. General: For trim with back flanges intended for fasteners, attach to framing with same screw fasteners used for gypsum board. Otherwise, attach trim according to the manufacturer’s written instructions.

2. Nailing, stapling, or crimping methods to install trim components are prohibited.

3. Install corner beads at all exterior corners of gypsum boards.

4. Install casings (metal trim) wherever gypsum board meets a dissimilar material, and in other locations indicated on the Drawings, except at floors where bottom of the board will be concealed by base, integral with flooring, resilient base, wood base or carpeted base.

3.05 APPLICATION OF ACOUSTIC SEALANT

A. General: Install sealant and backing in accordance with the recommendations of ASTM C919 and sealant manufacturer's recommendations.

1. Perform preparation in accordance with ASTM C790. Thoroughly clean all joints, removing all loose mortar, oil, grease, dust, frost, and other foreign materials that will prevent proper adhesion of primers and sealant materials.

2. If so recommended and furnished by the specific sealant manufacturer, apply primer to all joint surfaces, taking care not to stain adjacent surfaces.

B. Seal all partition perimeters prior to taping or compounding. Where perimeters are edged with metal trim, apply sealant and backing material between trim and dissimilar material.

C. Seal all penetrations in partition types designated for "acoustical" insulation. Penetrations to receive sealant include electrical boxes, plumbing, heating and air conditioning ducts, telephone, intercom hookups, and similar items.

1. Install joint bead backup in all joints in excess of 5/8 in. depth, and joints that have no backup therein, placing the joint bead in the joint in a manner that will assure a constant depth 1/8 in. greater than the sealant and caulking material depth tolerances.

a. Set beads into joints continuously, by slightly stretching during placement, to permit compression against sides of joint, without surface wrinkles or buckles.

b. Do not stretch backup material into joints.

c. Install bond breaker wherever recommended by the sealant manufacturer to prevent bond of the sealant to surfaces where such bond might impair the Work.

2. Apply sealant in continuous beads without open joints, voids, or air pockets.

a. The depth of sealant and caulking materials shall be in accordance with manufacturer's recommendations for the specific joint function,

but in no case exceed 1/2 in. in depth, nor less than 1/4 in., regardless of the joint width.

3. Remove the temporary masking tape immediately after tooling, and before the sealant or caulking material has taken initial set.

3.06 APPLICATION OF JOINT TREATMENT

A. Install joint tape at all joints where gypsum boards abut and where boards form internal corners, whether or not such joints will be concealed from view.

B. Apply compound to all joints, edges, corners, fastener head depressions and abrasions in the surfaces, whether or not such conditions will be concealed from view. Sand completely smooth all compound surfaces, which will be exposed to view, and leave ready to receive applied coatings or finish.

C. Provide the minimum levels of gypsum board finishes as defined by the Gypsum Association recommended Specifications GA-214 and GA-216, per the following:

1. At areas hidden from view, except as otherwise specified: Level 1.

2. At areas hidden from view, requiring a fire rating: Level 1.

3. At concealed plenum spaces above ceilings and attic spaces: Level 1.

4. At non-occupied spaces (i.e., attics): Level 1.

5. At surfaces scheduled to receive painted finishes: Level 4, except at each of the following conditions, provide Level 5 finish:

a. Boards having glass-fiber facing scheduled to receive a painted finish.

b. Surfaces subject to long dimensional runs, sun-lit and grazed lighting conditions.

c. Wall surfaces scheduled to received painted video-projection viewing surfaces.

d. Wall surfaces scheduled to received painted dry-erase coatings.

e. Wall surfaces scheduled to received dry-erase wallcoverings.

f. Wall surfaces with a light cove at the ceiling level.

g. Wall surfaces that are lit with raking light or washed with lights.

h. Wall surfaces that are perpendicular to an exterior wall that have a window coming right up to the intersection of the interior and exterior walls.

i. Locations noted on Drawings.

3.07 TOLERANCES

A. Maximum variation for gypsum board partitions and ceilings from true flatness: 1/8 in. per 10 ft, noncumulative.

3.08 CLEANING

A. Daily clean work areas by sweeping and disposing of debris, scraps, and deposits of compound and gypsum fill.

B. After completion of the work of this Section, remove equipment, and clean all wall, partition, and floor areas free from deposits of gypsum fill, and other materials installed under this Section.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for existing work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 220000

PLUMBING

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SECTION 220000

PLUMBING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 - General Requirements, shall be included in, and made part of, this Section.

1.02 DESCRIPTION OF WORK

A. Carefully examine all of the Contract Documents, criteria sheets and all other Sections of the specifications for requirements which affect work under this Section, whether or not such work is specifically mentioned in this Section.

B. The work under this Contract shall include all labor, materials, tools, equipment, transportation, insurance, temporary protection, supervision and incidental items essential for proper installation and operation, even though not specifically mentioned or indicated on the drawings, but which are usually provided or are essential for proper installation and operation, of all systems as indicated on the drawings and specified herein.

C. Coordinate work with that of all other Trades affecting or affected by the work of this Section. Cooperate with such Trades to assure the steady progress of all work under the Contract.

D. The specifications and drawings describe the minimum requirements that must be met by the Plumbing Subcontractor for the installation of all work as shown on the drawings and as specified here-in-under. The following major items of work are included under Section 220000:

1. Storm conductor piping systems
    a. Emergency roof drainage system
2. Insulation
3. Drains:
    a. Roof Drains

4. Instructions

5. Record Drawings/As-Built Drawings

6. Operation and Maintenance Manuals

7. Connections to existing systems

8. Phasing

9. Permits and fees

10. Modifications to existing piping systems

11. Submittals

12. Coordination drawings

13. Subcontractor certificate of completion

1.03 RELATED WORK

A. Related Work

1. For work related to and to be coordinated with the Plumbing work, but not included in this Section, and required to be performed under other designated Sections or Divisions, see the following:

a. Section 334200 – Stormwater Systems

b. Section 075419 – PVC Roofing

c. Section 092900 – Gypsum Board

B. Furnish the following materials to be installed under other Divisions and Sections as listed.

1. Installation of access panels furnished under this Section shall be by the Trades as designated by the Construction Manager/General Contractor.

C. The following work is not included in this section and is to be performed under other sections of the specifications:

1. Cutting and patching.

2. Housekeeping pads

3. Flashing of all pipe penetrations

4. Finish painting

5. Heating, ventilation and air conditioning work

6. Electrical power wiring

7. Temporary light, power, water, heat, and sanitary facilities for use during construction and testing.

8. Fire Protection work

9. Fire alarm work

1.04 PERMITS, FEES AND TAXES

A. Plumbing Subcontractor for the work in his scope of work shall give all necessary notices, obtain all permits, pay all governmental taxes, fees and other costs in connection with his work; file for necessary approvals with the jurisdiction under which the work is to be performed. Plumbing Subcontractor shall obtain all required Certificates of Inspection for his respective work and deliver same to the Architect before request for acceptance of his portion of work is made and before final payment.

1.05 REFERENCES

A. All materials and workmanship shall comply with all applicable Codes, Specifications, Local and State Ordinances, Industry Standards and Utility Company Regulations, latest editions.

B. In case of difference between Building Codes, State Laws, Local Ordinances, Industry Standards and Utility Company Regulations and the Contract Documents, the Plumbing Subcontractor shall promptly notify the Architect in writing of any such difference.

C. In case of conflict between the Contract Documents and the requirements of any Code or Authorities having jurisdiction, the most stringent requirements of the aforementioned shall govern.

D. Should the Plumbing Subcontractor perform any work that does not comply with the requirements of the applicable Building Codes, State Laws, Local Ordinances,

Industry Standards and Utility Company Regulations, he shall bear all costs arising in correcting the deficiencies, as approved by the Architect/Owner.

E. Applicable Codes and Standards shall include all State Laws, Local Ordinances, Utility Company Regulations, and the applicable requirements of the latest adopted edition of the following Codes and Standards, without limiting the number, as follows:

1. NFPA 70: National Electrical Code
2. NFPA 54: National Fuel Gas Code
3. NFPA 101: Life Safety Code
4. ASSE: American Society of Sanitary Engineers
5. Occupational Safety and Health Standards
6. Environmental Protection Agency
7. National Fire Protection Association
8. Connecticut Building Code
9. Connecticut Plumbing Code
10. Connecticut State Building Inspectional department

F. In these specifications, references made to the following Industry Standards and Code Bodies are intended to indicate the latest volume or publication of the Standard. All equipment, materials and details of installation shall comply with the requirements and latest revisions of the following Bodies, as applicable:

1.	ANSI:	American National Standards Institute
2.	ASTM:	American Society of Testing Materials
3.	FM:	Factory Mutual
4.	ASSE:	American Society of Sanitary Engineers
5.	CS:	Commercial Standards, U.S. Department of Commerce

6.	MSS:	Manufacturer's Standardization Society of the Valve and Fittings Industry
7.	ASME:	American Society of Mechanical Engineering
8.	AWS:	American Welding Society
9.	NEMA:	National Electrical Manufacturers Association
10.	UL:	Underwriters' Laboratories

1.06 QUALITY ASSURANCE

A. Refer to Section 014000 - Quality Requirement in addition to the following part of this specification.

B. Refer to Section 012600 –Contract Modification Procedures in addition to the following part if this specification.

C. The manufacturers listed within these specifications have been pre-selected for use on this project. Where equipment of a substitute manufacturer differs from that specified require different arrangements or connections from those shown, it shall be the responsibility of the Subcontractor responsible for the substitution to modify the installation of the equipment/system to operate properly and in harmony with the original intent of the drawings and specifications. When directed by the Architect, the Plumbing Subcontractor shall submit drawings showing the proposed, substitute installation. If the proposed installation is accepted, the Plumbing Subcontractor shall make all necessary changes in all affected related work provided under his and other Sections including location of roughing in connections by other Trades, conduit, supports, etc. All changes shall be made at no increase in the Contract amount or additional cost to the Owner. The General Contractor shall be responsible to assure that the Subcontractor responsible for the substitution bears the cost arising to all other Trades as a result of the substitution.

D. All substitutions shall be accompanied by a completed Substitution Request Cover Sheet contained within this section.

E. Plumbing Subcontractor shall furnish and install all equipment, accessories, connections and incidental items necessary to fully complete the work under his Contract for use, occupancy and operation by the Owner.

F. Unless specifically indicated otherwise, all equipment and materials required for installation under these specifications shall be new, unused and without blemish or defect. Equipment and materials shall be products which will meet with the acceptance of the Authorities having jurisdiction over the work and as specified hereinbefore. Where such acceptance is contingent upon having the products listed and/or labeled by FM or UL or another testing laboratory, the products shall be so listed and/or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, a first class standard article shall be provided.

G. The following substitution request sheet shall be copied on to the Contractor's letterhead, filled out, signed and sealed by an Authorized Officer of the Corporation then submitted to the Architect to be approved prior to any substitutions being considered, including all "equals" by manufacturers' not listed in the specifications.

1.07 VALUE ENGINEERING

A. When equipment and/or materials are purchased from a manufacturer other than those specified, or this Subcontractor deviates from the engineers design under a Value Engineering Proposal or Substitution, the subcontractor shall provide a written guarantee that all systems shall perform equal to or better than the original design for the work. This Subcontractor shall be responsible for all collateral impacts to the project for replacement of such deviations and substitutions.

B. Refer to Section 012600 of Division 1 – Contract Modification Procedures for the requirements of this Section.

C. The manufacturers listed within this specification have been preselected for use on this project. Where equipment of a substitute manufacturer differs from that specified require different arrangements or connections from those shown, it shall be the responsibility of the Subcontractor responsible for the substitution to modify the installation of the equipment/system to operate properly and in harmony with the original intent of the drawings and specifications. Should the Plumbing Subcontractor wish to propose a substitution during the bid period, such request shall be made in writing to the Architect, no less than seven (7) working days, prior to bid date. If substitutions are deemed acceptable, such items shall be issued on as an Addendum by the contractor, prior to bid due date The above requirement is mandatory.

D. All substitutions shall be accompanied by a completed Substitution Request Cover Sheet contained within this section of the specifications.

E. Should this alternate material or equipment fail to meet the expectations of the owner within the guarantee period, this contractor shall replace the material and or equipment with the original specified items at no additional cost to the owner. This Subcontractor shall be responsible for all collateral impacts to the project for replacement of such deviations and substitutions.

1.08 WARRANTY

A. Refer to provisions of the General Requirements and Supplementary General Requirements in Division 1 regarding warranties for work under this Contract.

B. All warranties shall begin on the Date of Substantial Completion of the entire project or the Owner's acceptance of the workmanship and/or material covered by the warranty, whichever is later. The warranty coverage shall continue for the specified period. Refer to individual specification sections for warranty period. If

no specific warranty period is specified, the warranty shall extend for a minimum of 365 days.

C. Manufacturers shall provide their standard warranties for work under the Plumbing Trades. However, such warranties shall be in addition to, and not in lieu of, all other liabilities which the manufacturer and Plumbing Subcontractor may have by law or by other provisions of the Contract Documents.

D. All materials, items of equipment and workmanship furnished under the Plumbing Section shall carry the standard warranty against all defects in material and workmanship. Any fault due to defective or improper material, equipment, workmanship or design which may develop shall be made good, forthwith, by and at the expense of the Plumbing Subcontractor for the work under his Contract, including all other damage done to areas, materials and other systems resulting from this failure.

E. The Plumbing Subcontractor shall warranty that all elements of the systems which are to be provided under his Contract, are of sufficient capacity to meet the specified performance requirements as set forth herein or as indicated.

F. Upon receipt of notice from the Owner or Architect of failure of any part of the systems or equipment during the warranty period, the affected part or parts shall be replaced by the Plumbing Subcontractor for his work or any other work affected by the failure(s).

G. Plumbing Subcontractor shall furnish, before the final payment is made, a written warranty covering the above requirements in accordance with the General Requirements.

H. Upon final acceptance of the project by the Owner, the (1) year guarantee period of all equipment and materials will be initiated. During this period, the Contractor shall make a minimum of (2) visits to the site ([6] months after acceptance and immediately prior to the end of the guarantee period). These visits shall be performed in the presence of the Owner's representative. During each visit, the Contractor shall thoroughly check all equipment for proper operation and respond to any list of deficiencies prepared by the Owner. Formal reports shall be generated and forwarded to the Department of Physical Plant and Architect's Office describing the systems inspected, date of inspection and status of equipment.

1.09 DEFINITIONS

A. Words in the singular shall also mean and include the plural, wherever the context so indicates, and words in the plural shall mean the singular, wherever the context so indicates.

B. Wherever the terms "shown on drawings" are used in the specifications, they shall mean "noted", "indicated", "scheduled", "detailed", or any other diagrammatic or written reference made on the drawings.

C. Wherever the term "provide" is used in the specifications it will mean "furnish" and "install", "connect", "apply", "erect", "construct", or similar terms, unless otherwise indicated in the specifications.

D. Wherever the term "material" is used in the specifications it will mean any "product", "equipment", "device", "assembly", or "item" required under the Contract, as indicated by trade or brand name, manufacturer's name, standard specification reference or other description.

E. The terms "approved", or "approval" shall mean the written approval of the Architect. Where indicated in the product section of the specifications, "Approved Equal" shall mean the proposed substitute product must be approved by the Owner, Architect and Engineer in writing prior to acceptance on the project for submission. Basis of approval of a substitute product submitted for "Approved Equal" shall be at the sole discretion of the Owner, Architect and Engineer.

F. The term "Contract Documents" shall mean the entire set of Drawings and Specifications as listed in the Table of Contents of the General Conditions including all bound and unbound material and all items officially issued to date such as addenda, bulletins, job modifications, etc.

G. The term "specification" shall mean all information contained in the bound or unbound volume, including all "Contract Documents" defined therein, including schedules and notes on the drawings.

H. The terms "directed", "required", "permitted", "ordered", "designated", "prescribed", and similar words shall mean the direction, requirement, permission, order, designation or prescription of the Architect; the terms "approved", "acceptable", "satisfactory", and similar words shall mean approved by, acceptable or satisfactory to the Architect; and, the terms "necessary", "reasonable", "proper", "correct", and similar words shall mean necessary, reasonable, proper or correct in the judgment of the Architect.

I. "Accessible" indicates ease of access with or without the use of ladders and without requiring extensive removal of other equipment, such as ductwork, piping, etc. to gain access. "Accessible ceiling" indicates acoustic tile type hung ceilings. Concealed spline or sheetrock ceilings with access panels shall not be considered accessible ceilings.

J. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.

K. "Exposed" means not installed underground or "concealed" as defined above.

L. "Plumbing Subcontractor" or "Plumbing Contractor" refers to the Subcontractor or Contractor responsible for furnishing and installation of all work indicated on the Plumbing drawings and in the Plumbing specifications.

M. "Architect" shall refer to the Architect "DHK Architects"

N. "Owner" shall refer to the Owner or their designated representative.

O. "Other Work Contractor" (O.W.C.) refers to the Contractor(s), or Subcontractor(s) performing work under other Sections of the Contract Documents.

P. "O.F.C.I" means "Owner Furnished Contractor Installed".

Q. "O.F.O.I" means "Owner Furnished Owner Installed".

R. Engineer shall refer to "Robert W. Sullivan Engineers, Inc. (RWS)".

1.10 THE SUBCONTRACTOR

A. The Plumbing Subcontractor shall visit the site of the proposed new facility and base his bids from his own site examinations and estimates. The Plumbing Subcontractor shall not hold the Architect, Engineer, Owner or their agents or employees responsible for, or bound by, any schedule, estimate or of any plan thereof. The Plumbing Subcontractor shall study the Contract Documents included under this Contract to determine exactly the extent of work provided under this Contract, as well as to ascertain the difficulty to be encountered in performing the work, in installing new equipment and systems and coordinating the work with the other Trades and existing building conditions.

B. The Plumbing Subcontractor shall faithfully execute his work according to the terms and conditions of the Contract and specifications, and shall take all responsibility for and bear all losses resulting to him in the execution of his work.

C. The Plumbing Subcontractor shall be responsible for the location and performance of work provided under his Contract as indicated on the Contract Documents. All parties employed directly or indirectly by the Plumbing Subcontractor shall perform their work according to all the conditions as set forth in these specifications.

D. The Plumbing Subcontractor shall furnish all materials and do all work in accordance with these specifications, and any supplementary documents provided by the Architect. The work shall include everything shown on the drawings and/or required by the specifications as interpreted by the Architect, regardless of where such information is indicated in the Contract Documents (Architectural, HVAC, Plumbing, Fire Protection, etc.). Unless specifically indicated otherwise, all work and materials furnished and installed shall be new, unused and of the best quality and workmanship. The Plumbing Subcontractor shall cooperate with the Architect so that no error or discrepancy in the Contract Documents shall cause defective materials to be used or poor workmanship to be performed.

1.11 COORDINATION OF WORK

A. The Plumbing Subcontractor shall compare his drawings and specifications with those of other Trades as well as the Architectural drawings and specifications, and report any discrepancies between them to the Architect and obtain from the Architect written instructions for changes necessary in the plumbing work.

B. Coordinate work with that of all other Trades affecting or affected by the work of this Section. Cooperate with such Trades to assure the steady progress of all work under the Contract.

C. All work shall be installed in cooperation with other Trades installing interrelated work. Before installation, Plumbing Subcontractor shall make proper provisions to avoid interferences in a manner approved by the Architect. All changes required in the work of the Plumbing Subcontractor or that of any other trade caused by the Plumbing Subcontractor's neglect, shall be made by him at his own expense, and to the Architect's satisfaction.

D. The Plumbing Subcontractor shall include in his bid sufficient dollar amounts to coordinate the work of this Contract. This project MAY require additional time to coordinate all Trades and allow implementation of the Owner’s Standards and maintenance serviceability requirements. This requirement shall include, but not be limited to, producing the coordination drawings, as many times and as many

drawings as required, to ensure serviceability of equipment, as approved by the Architect.

E. Locations of pipes and equipment, etc. shall be adjusted to accommodate the work with interferences anticipated and encountered. The Plumbing Subcontractor shall determine the exact routing and location of his systems prior to fabrication or installation of any system component. Accurate measurements and coordination drawings shall be completed to verify dimensions and characteristics of the various systems installations.

F. Lines which pitch shall have the right-of-way over those which do not pitch. For example, gravity drainage piping shall normally have the right-of-way. Lines whose elevations cannot be changed shall have the right-of-way over lines whose elevations can be changed.

G. Offsets, transitions and changes of direction in all systems shall be made as required to maintain proper headroom and pitch of sloping lines whether or not indicated on the drawings. The Plumbing Subcontractor shall provide offsets and materials and labor required to achieve these offsets etc. as required for his work to effect these offsets, transitions and changes in direction.

H. All work shall be installed in a way to permit removal (without damage to other parts) of coils, filters, control appurtenances, belts and belt guards, drives, sheaves and all other system components provided under this Contract requiring periodic replacement or maintenance. All piping and appurtenances shall be arranged in a manner to clear the openings of swinging overhead access doors as well as ceiling tiles. All work shall be done to allow easy access for maintaining equipment. The Owner and Engineer will require proof via the preparation of large scale sections and part plans that all components are accessible after the work is completed. Any items in the field discovered to be in non-compliance shall be removed and relocated, as required, and as directed by the Architect and at no cost to the Owner.

I. The Contract Drawings are diagrammatic only intending to show general runs and locations of piping, equipment, etc. and not necessarily showing all required offsets, details and accessories and equipment to be connected. All work shall be accurately laid out with other Trades to avoid conflicts and to obtain a neat and workmanlike installation which will afford maximum accessibility for operation, maintenance and headroom.

J. Where discrepancies in scope of work as to what Trade provides items, such as starters, disconnects, flow switches, alarm points, etc., exist, such conflicts shall

be reported to the Architect during bidding and prior to signing of the Contract. If such action is not taken, the Plumbing Subcontractor shall furnish such items as part of his work as necessary, for complete and operable systems and equipment, as determined by the Architect.

K. Where drawing details, plans, specification requirements and/or scheduled equipment capacities are in conflict and where piping or equipment are shown to be different (including pipe sizes) between plans and/or between plans and riser diagrams, details or specifications, the most stringent requirement will be included in the Contract. Plumbing systems and equipment called for in the specification and/or shown on the drawings shall be provided under this Contract as if it were required by both the drawings and specifications. However, prior to ordering or installation of any portion of work which appears to be in conflict, such work shall be brought to Architect's attention for direction as to what is to be provided.

L. Final location of all plumbing fixtures, access panels, cleanouts, wall layouts, roof, area, trench and floor drains, etc., shall be coordinated with the Architectural reflected ceiling plans, architectural elevations, and/or other Architectural details, as applicable and shall not be scaled from locations indicated on the Plumbing drawings. Obtain approval of locations of all items from Architect in the field.

M. Plumbing connections to all equipment shown on the Plumbing and/or Architectural drawings that are to be provided with services, shall be included under this Contract as applicable, including all rough and finish piping, trim, valves, gauges and connections to systems, to make equipment complete and operable. Additional piping, equipment, etc., shall be provided to accomplish the above requirement, as required, all as part of this Contract, at no extra cost to the Owner. This requirement necessitates that the Plumbing Subcontractor review the Architectural drawings and the drawings of other Trades during bidding to ascertain the extent of all requirements, and interface between the Trades and scope of work.

N. The Plumbing Subcontractor shall coordinate his work with other Trades' work so that all equipment and systems can be easily, safety and properly serviced and maintained. It is imperative that service personnel can safely access all

1.12 GIVING INFORMATION

A. Plumbing Subcontractor shall keep himself fully informed as to the shape, size and position of all openings required for his equipment and shall give information to the General Contractor and other Subcontractors sufficiently in advance of the work so that all openings may be built in advance.

1.13 EQUIPMENT AND MATERIALS

A. All Equipment of one type (such as valves, pumps, water heaters, drainage specialties, interceptors/traps, etc.,) shall be the product of one manufacturer, unless noted otherwise in this specification.

B. Equipment and materials shall be delivered to the site and stored in original sealed containers, suitably sheltered from the elements, but readily accessible for inspection by the Architect until installed. All items subject to moisture damage such as switches, controls, etc., shall be stored in dry, heated spaces.

C. Equipment shall be tightly covered and protected against dirt, water, and chemical or mechanical injury and theft. At the completion of the work, equipment and materials shall be cleaned and polished thoroughly and turned over to the Owner in a condition satisfactory to the Architect. Damage or defects that develop before acceptance of the work shall be made good at the Plumbing Subcontractor's expense.

D. The Plumbing Subcontractor shall make necessary field measurements to ascertain space requirements, for equipment and connections to be provided under his respective Trade and shall furnish and install such sizes and shapes of equipment to allow for the final installation to conform to the drawings and specifications.

E. Manufacturers' directions shall be followed completely in the delivery, storage, protection and installation. Promptly notify the Architect in writing of any conflict between any requirements of the Contract Documents and the manufacturer's directions. Obtain the Architect's written instructions before proceeding with the work. Should Plumbing Subcontractor perform any work that does not comply with the manufacturer's directions or written instructions from the Architect, he shall bear all costs arising in correcting any deficiencies that should arise.

F. Equipment pre-purchased by the General Contractor on behalf of the Owner or by the Owner himself, if assigned to the Plumbing Subcontractor, shall be received, installed, tested, etc., as if the equipment was purchased by the Plumbing Subcontractor. All guarantees, service contracts, etc., shall be the same as for all other equipment provided under this Contract.

G. Refer to Section 012600 – Contract Modification Procedures or the requirements of this Section.

H. The manufacturers listed within this specification have been preselected for use on this project. Where equipment of a substitute manufacturer differs from that specified require different arrangements or connections from those shown, it shall be the responsibility of the Subcontractor responsible for the substitution to modify the installation of the equipment/system to operate properly and in harmony with the original intent of the drawings and specifications. Should the Plumbing Subcontractor wish to propose a substitution during the bid period, such request shall be made in writing to the Architect, no less than seven (7) working days, prior to bid date. If substitutions are deemed acceptable, such items shall be issued on as an Addendum by the contractor, prior to bid due date The above requirement is mandatory.

I. All substitutions shall be accompanied by a completed Substitution Request Cover Sheet contained within this section of the specifications.

J. The Plumbing Subcontractor shall furnish and install all equipment, accessories, connections and incidental items necessary to fully complete the work under his Contract for use, occupancy and operation by the Owner.

K. All equipment and materials required for installation under these specifications shall be new and without blemish or defect. Equipment and materials shall be products which will meet with the acceptance of the Authorities having jurisdiction over the work and as specified hereinbefore. Where such acceptance is contingent upon having the products listed or labeled by FM, UL or other testing laboratories, the products shall be so listed or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, a first class standard article shall be provided.

1.14 USE OF PREMISES

A. The Plumbing Subcontractor shall confine all apparatus, storage of materials and construction to the limits as directed by the Architect or owner and he shall not encumber the premises with his materials. The Plumbing Subcontractor shall be held responsible for repairs, patching, or cleaning arising from any unauthorized use of premises.

B. In storing materials within areas (structure or ground), or when used as a shop, the Plumbing Subcontractor shall consult with the Construction Manager and shall restrict his storage to space designated for such purposes. The Plumbing

Subcontractor will be held responsible for repairs, loss, patching or cleaning arising from any unauthorized use of the premises.

C. Notwithstanding any approvals or instructions which must be obtained by the Plumbing Subcontractor from the Architect in connection with the use of the premises, the responsibility for the safe working conditions at the site shall remain that of the Plumbing Subcontractor. The Architect, Engineer or Owner shall not be deemed to have any responsibility or liability in connection with safe working conditions at the site.

1.15 PROTECTION

A. Materials, such as valves, pipes, fittings, pumps, water heaters, plumbing fixtures, drains, etc., shall be properly protected during construction and all pipe openings shall be temporarily closed so as to prevent obstruction and damage. Post notice prohibiting the use of all systems provided under the Plumbing Contract, prior to completion of work and acceptance of all systems by the Owner except as otherwise instructed by Architect. Take precautions to protect all materials furnished from damage and theft.

B. The Plumbing Subcontractor shall furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or electrical systems provided under his Contract.

1.16 DAMAGE TO OTHER WORK

A. The Plumbing Subcontractor shall be held responsible and shall pay for all damages caused by his work to the building structures, equipment, conduits, systems, apparatus, etc., and all work and finishes installed under this Contract. Repair of such damage shall be done by the General Contractor at the expense of the Plumbing Subcontractor, to the Architect's satisfaction.

1.17 CORRECTION OF WORK

A. The Plumbing Subcontractor shall promptly correct all work provided under his Contract and rejected by the Architect as defective or as failing to conform to the Contract Documents, whether observed before or after completion of work, and whether or not fabricated, installed or completed.

1.18 EXTRA WORK

A. No claim for extra work will be allowed unless it is authorized by the Architect in writing before commencement of the extra said work.

1.19 TOUCH-UP PAINTING

A. All equipment and systems shall be thoroughly cleaned of rust, splatters and other foreign matter or discoloration leaving every part of all systems in an acceptable prime condition. The Plumbing Subcontractor, for the work under his Contract, shall refinish and restore to the original condition all equipment which have sustained damage to the manufacturer's prime and finish coats of paint and/or enamel during the course of construction, regardless of the source of damage.

1.20 COORDINATION DRAWINGS

A. Before materials are purchased, fabricated or work is begun, each Subcontractor shall prepare and obtain approval of coordination drawings, and sections for all floors/areas, including buried system/services, resulting in one (1) set of all-Trade-composite at 3/8" scale drawings, showing the size and location of all equipment, in the manner described here-in-under General Requirements. Architects review and approval of coordination drawings must be obtained prior to any fabrication or installation of any equipment or systems.

B. Coordination drawings are for the architect’s use during construction and shall not be construed as shop drawings or as replacing shop drawings. The coordination drawings, when corrected for actual “as-built” conditions, will be reviewed by the Architect, corrected and become the Record Drawings to be submitted to the Owner for their use.

C. The cost of producing and reproducing the drawings will be included under the Contract of each Trade, including the cost or preparation of the Architectural building outlines. The HVAC Contractor shall take the lead to produce the Architectural backgrounds, show all ductwork, piping, etc., and circulate the drawings to any of his Contractors and the other Trades (Plumbing, Fire Protection, Electrical), so that they can indicate all their work as directed by the Architect as required, to result in a fully coordinated installation.

D. Prepare a complete set of computer based AutoCAD (latest version) drawings at scale not less than 3/8” equals 1’-0”, showing basic layout for the structure and other information as needed for preparation of Coordination Drawings. The drawings shall indicate the layout of all specialty trade work as indicated herein and shall be designated as Coordination Drawings. The Contractors can obtain a copy of the floor plans on disk from the engineer to assist in the preparation of Coordination Drawings. The Contractor shall provide a minimum of two (2) weeks’ notice to the engineer for the preparation of the disk. A signed liability

release form will be required from the Contractor prior to the release of the disk by the engineer.

E. Highlight all fire rated partitions on the Coordination Drawings for appropriate coordination.

F. The main paths for the installation or removal of equipment from mechanical and electrical rooms shall be clearly indicated on the Coordination Drawings.

G. Each of the specialty trades shall add its work to the base drawings with appropriate elevations and grid dimensions. Specialty trade information shall be required for fan rooms and mechanical rooms, horizontal exits from duct shafts, crossovers and for spaces in the above ceilings where congestion of work may occur such as corridors and where required, entire floors. Drawings shall indicate horizontal and vertical dimensions to avoid interference with structural framing, ceilings, partitions and other services. Indicate elevations relative to finish floor for bottom of ductwork and piping and conduit 2" greater in diameter.

1. Specialty Trade shall include:

a. Plumbing system

b. HVAC piping and equipment.

c. Electrical system

d. Sheet Metal Work

e. Fire Protection System

f. ATC system

g. Structure

H. Upon completing their portion of the Coordination Drawings, each specialty trade shall sign, date and return Coordination Drawings to the Contractor.

I. Where conflicts occur with placement of materials of various trades, the General Contractor shall be responsible to coordinate the available space to accommodate all trades. Any resulting adjustments shall be initialized and dated by the affected specialty trade Contractor. The General Contractor shall then final date and sign each drawing.

J. Fabrication shall not start until Coordinate Drawings have been distributed to all parties as indicated herein.

K. Format: Coordination Drawings (plan only) shall be done using AutoCAD on PC Format disks shall be given to the architect for future transfer to Owner. Coordination Drawings will be used as basis for as-built drawings.

L. Distribution of Coordination Drawings:

1. The General Contractor shall provide one print of each Coordination Drawing to:

a. Each specialty trade Contractor.

b. Owner

c. Construction Manager

d. Architect (for record purposes)

2. The method used to resolve interferences not previously identified shall be as in paragraph I above. Distribute revised Coordination Drawings to all parties listed above.

M. Coordination drawings include but are not necessarily limited to:

1. Structure

2. Partition/room layout, including indication of smoke and fire resistance rated partitions.

3. Major electrical conduit runs, panelboards, feeder conduit and racks of branch conduits. Motor control centers, starters and disconnects.

4. All fire protection standpipe piping, sprinkler piping and sprinkler heads.

5. All equipment, including items in the Contract as well as O.F.C.I. and O.F.O.I. items.

6. Equipment located above finished ceiling requiring access for maintenance and service. In locations where acoustical lay-in ceilings occur indicate areas in which the required access area may be greater than the suspended grid systems.

1.21 RECORD DRAWINGS/AS-BUILT DRAWINGS

A. The Plumbing Subcontractor shall maintain current at the site a set of his drawings on which he shall accurately show the actual installation of all work provided under his Contract indicating hereon any variation from the Contract Drawings, in accordance with the General Conditions and Division 1. Changes, whether resulting from formal change orders or other instructions issued by the Architect, shall be recorded. Include changes in sizes, location, and dimensions of piping, equipment, fixtures, etc.

B. The Plumbing Subcontractor shall indicate progress by coloring-in various piping, equipment and associated appurtenances exactly as they are erected. This process shall incorporate both the changes noted above and all other deviations from the original drawings whether resulting from job conditions encountered or from any other causes.

C. The marked-up and colored-up prints will be used as a guide for determining the progress of the work installed. They shall be inspected periodically by the Architect and Owner and they shall be corrected immediately if found either inaccurate or incomplete. This procedure is mandatory.

Failure to comply with this requirement could result in a reduction of the monthly payment requisition recommended.

D. At the completion of the job, these prints shall be submitted to the General Contractor and then to the Architect for final review and comment. The prints will be returned with appropriate comments and recommendations. These corrected prints, together with corrected prints indicating all the revisions, additions and deletions of work, shall form the basis for preparing a set of As-Built Record Drawings.

E. The Plumbing Subcontractor shall be responsible for generating As-Built Record Drawings utilizing CAD based documents in AutoCAD (latest version) format. A bound set of plans, as well as the computer files, on disk, shall be turned over to the Architect for review. After acceptance of the As-Built documents by the Architect, the Plumbing Subcontractor shall make any corrections necessary to the As-Built documents and prepare one reproducible set of drawings as well as bound blueprint set(s) (quantity as determined by the Architect) for distribution to the Owner via the Architect.

F. The Plumbing Subcontractor may use the computer drawing files used for coordination drawings or obtain the Engineers most recently updated computer drawing files. The updated drawings may not include all changes made during

the course of construction and it shall be the Plumbing Subcontractors responsibility to update the As-Built documents to include all changes brought forth to the project resulting from bulletins, request for information (RFI's), change orders, etc. The Engineer will not be responsible for updating the computer files.

G. Included with the above shall be a complete drawing list and a standard layering system, which shall be required to be maintained within the As-Built Record AutoCAD (latest version) documents.

H. As-builts shall be delivered to the owner in electronic format in AutoCAD (Latest Version) and PDF.

I. The As-Built AutoCAD (latest version) documents required shall be in addition to other requirements stated elsewhere.

1.22 SHOP DRAWING SUBMITTALS

A. Prepare and submit shop drawings in accordance with the requirements herein before specified, and with the Shop Drawings, Product Data and Samples in Division 1 in the manner described therein, modified as noted hereinafter.

B. All shop drawings shall have clearly marked the appropriate specification number of drawing designation, for identification of the submittal.

C. Disposition of shop drawings shall not relieve the Plumbing Subcontractor from the responsibility for deviations from drawing or specifications, unless he has submitted in writing a letter itemizing or calling attention to such deviations at time of submission and secured written approval from the Engineer, nor shall such disposition of shop drawings relieve the Plumbing Subcontractor from responsibility for errors in shop drawings or schedules.

D. Shop drawing data shall include, but not be limited to, the following:

1. Manufacturer’s model and catalog data.

2. Complete connection diagrams for all Trades.

3. Dimensions, capacities, ratings, materials, finishes, etc.

E. Each shop drawing is required to bear the review stamp of each Contractor associated with installing the equipment and/or processing the document.

F. All final approved shop drawings shall be included in the required O & M manuals.

G. Contractor will be charged per the Engineer's fee for reviewing more than two (2) submittals of a given item.

H. Submittals shall be grouped per division and per specification paragraph (ie. all valves together, all plumbing fixtures together, all piping materials and fittings together, all hangers together, all firestopping together, etc. Resubmittals shall be numbered the same as the original submittal and designated with the appropriate resubmittal iteration (R#).

I. Submittals shall be electronically generated PDF (or approved format), electronically searchable and electronically tabbed per section.

J. Shop drawings shall include but shall not be limited to the following:

1. Plumbing work layout, including location and sizes of piping, valves, cleanouts, equipment, connections, drains, test stations, alarm panels, and all other accessories

2. Equipment cuts and manufacturer's documentation for

a. Plumbing fixtures and trim, including fixture supports and fasteners

b. Equipment

c. Piping and fittings

d. Drainage specialties

e. Insulation

f. Hangers, supports, fasteners

g. Expansion joints, anchors and guides

1.23 WATERPROOFING.

A. Plumbing Subcontractor shall coordinate with the General Contractor the counter-flashing of all piping and equipment provided by him, which pierce roofs, walls and other weather-barrier surfaces. Waterproofing and counter-flashing shall be provided by the General Contractor. Refer to Division 1.

B. Any leaks developed due to Plumbing Subcontractor's work shall be repaired at the Plumbing Subcontractor's expense, to Architect's satisfaction.

C. All water proofing work shall be performed in a workmanlike manner to assure weatherproof installation. Any leaks developed due to this Contractor’s work shall be repaired at his expense, to the Architect’s satisfaction.

D. Pipes passing through slabs shall have the sleeve extended above floors as hereinafter specified to retain any water and the space between the pipe and sleeve caulked with fire proof and smoke proof material, sealed with monolastic caulking compound. The space between the outside of the sleeve and the floor slab shall be caulked watertight sufficiently to hold 2 inches of standing water.

1.24 MISCELLANEOUS IRON AND STEEL

A. Except where specifically indicated for the General Contractor to provide supports, Plumbing Subcontractor shall provide all steel supports and hangers required to support all equipment or materials provided under this Contract.

B. All supports shall be cut, assembled, welded and finished by skilled mechanics. Welds shall be ground smooth. Stands, brackets and framework shall be properly sized and strongly constructed.

C. Measurements shall be taken on the job and worked out to suit adjoining and connecting work. All work shall be performed by experienced metal working mechanics. Members shall be straight and true and accurately fitted.

D. Drilling, cutting and fitting shall be done as required to properly install the work and accommodate the work of other Trades as directed by them.

E. Members shall be generally welded except that bolting may be used for field assembly where welding would be impractical.

F. All shop and field fabricated iron and steel work shall be cleaned and dried and given a coat of rust inhibiting paint on all surfaces and in all openings and crevices

1.25 FIRESTOPPING AND SMOKESTOPPING

A. The Plumbing Subcontractor shall provide fire-stopping and smoke-stopping of all plumbing penetrations where required by Code and as determined by the Architect.

B. The Plumbing Subcontractor shall review fire-stop or smoke-stop systems provided under Division 07 – Fire-Stopping and provide same as specified under Division 07.

C. Where pipes are installed thru sleeves, the sleeves shall be of sufficient size to provide 1/2" air space around the pipe passing through the sleeve and all openings shall be sealed, smoke-stopped and made tight.

D. Where core drilling has been provided, the core shall be of sufficient size to provide 1/2" air space around the pipe passing through the core hole and all openings shall be sealed, smoke-stopped and made tight.

E. Where sleeves are installed for future pipe installation, all sleeves shall be sealed, smoke-stopped and made tight.

F. Related Documents

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

G. Work Included

1. Through-penetration firestop systems for penetrations through the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:

a. Floors

b. Roofs

c. Walls and partitions

d. Smoke barriers

e. Construction enclosing compartmentalized areas.

f. Other rated assemblies.

H. Related Sections

1. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

I. References

1. American Society for Testing and Materials Standards (ASTM):

   a. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials

   b. ASTM E814: Standard Test Methods for Fire Tests of Through-Penetration Firestops

   c. ASTM E119: Standard Test Methods for Fire Tests of Building Construction Materials

   d. ASTM E1399: Standard Test Methods for Cyclic Movement and Measuring of Joint Systems

   e. ASTM E1725: Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems of Electrical Systems Components

   f. ASTM E1966: Standard Test Methods for Fire Tests of Joints

   g. ASTM E 2174: Standard Practice for On-Site Inspection of Installed Fire Stops

   h. ASTM G21: Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

   i. ASTM E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

   j. ASTM C1241: Standard Test Method for Volume Shrinkage of Latex Sealants During Cure

   k. ASTM E699: Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components

l. ASTM E3038-16: Standard Practice for Assessing and Qualifying Candidates as Inspectors of Firestop Systems and Fire-Resistive Joint Systems

2. Underwriters Laboratories, Inc. (UL):

a. UL 723 Surface Burning Characteristics of Building Materials

b. UL 1479 Fire Tests of Through-Penetration Firestops, including optional water leakage and air leakage tests

c. UL 2079 Fire Test of Building Joint Firestop systems

d. UL Fire Resistance Directory (Component Listing Test Criterion)

e. UL Fire Resistance Firestop Devices (XHJI)

f. UL 1489: Standard for Safety Fire Tests of Fire-Resistant Pipe Protection Systems Carrying Combustible Liquids

3. National Fire Protection Agency (NFPA)

a. NFPA 101 Life Safety Code

b. NEC 70 National Electrical Code

c. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

J. Performance Requirements

1. General: For the following constructions, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.

a. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.

b. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.

c. Fire-resistance-rated floor assemblies.

d. Fire-resistance-rated roof assemblies.

2. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

3. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas.

a. Penetrations located outside wall cavities.

b. Penetrations located outside fire-resistive shaft enclosures.

c. Penetrations located in construction containing fire-protection rated openings.

d. Penetrating items larger than 4-inch diameter normal pipe or 16 sq. in. in overall cross-sectional area.

4. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide product that after curing do not deteriorate when exposed to these conditions both during and after construction.

a. For piping penetrations for plumbing systems, provide moisture-resistant through-penetration firestop systems. For floor penetrations, provide firestop systems with a Class 1 W-Rating as determined in accordance with water leakage test per UL1479

b. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.

c. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

5. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-development ratings of less than 450, as determined per ASTM E 84.

6. For through-penetrations in smoke barriers, provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814 with air leakage L-Rating not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.

7. Mold Resistance: Provide firestopping materials with mold and mildew resistance rating less than or equal to 1 as determined by ASTM G21.

K. Submittals

1. See Division 01 for Additional Requirements.

2. Product Data: For each type through-penetration firestop system product indicated.

3. Shop Drawings: For each through-penetration firestop system show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating items. Include firestop design designation of testing and inspecting agency acceptable to authorities having, jurisdiction that evidences compliance with requirements for each condition indicated.

a. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.

b. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering

judgment documents must follow requirements set forth by the International Firestop Council.

4. Submit complete plans indicating clearly where all seals are located and the type of seal to be used at that location.

5. Qualification Data: For firms and persons specified to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

6. Product Certificates: Signed by manufacturers of through-penetration firestop system products certifying that products furnished comply with requirements.

7. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

8. Material Safety Data Sheets: Submit material safety data sheets provided with product delivered to job-site.

L. Quality Assurance

1. Installer Qualifications: Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

2. Installation Responsibility: Assign installation of through-penetration firestop systems in Project to a single sole source firestop specialty contractor with at least one of the following qualifications:

   a. FM 4991 Approved Contractor

   b. UL Approved Contractor

   c. Hilti Accredited Firestop Specialty Contractor

3. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, from a single manufacturer.

4. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in "Performance Requirements" Article:

    a. Through-Penetration Firestop Systems tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, ITS, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.

    b. Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements:

        1) Through-penetration firestop system products hear classification marking of qualified testing and inspecting agency.

        2) Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

            a) UL in "Fire Resistance Directory."

            b) ITS in "Directory of Listed Products."

M. Delivery, Storage, And Handling

1. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture; lot number; shelf life, if applicable, qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

2. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

N. Project Conditions

1. Environmental Limitations: Do not install through-penetration fires top systems when ambient or substrate temperatures are outside limits permitted by through penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

2. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

O. Coordination

1. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

2. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

3. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

4. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until Owner's inspecting agency and building inspector, if required by authorities having jurisdiction, have examined each installation.

1.26 DEMOLITION AND MAINTAINING EXISTING SERVICES

A. During the execution of the work, required relocation, rerouting, etc., of existing equipment and systems on the site or where new work is to be installed or new connections are scheduled to be made, shall be performed by the Plumbing Subcontractor, as indicated on the drawings, and/or as required by job conditions and as determined by the Architect in the field, to facilitate the installation of the new systems.

B. The Owner will require continuous operation of the existing systems, while demolition, relocation work or new tie-ins will be performed. Outages required for construction purposes shall be scheduled for the shortest practical periods of time, in coordination with the Owner's designated representative, for specified, mutually agreeable periods of time, after each of which the interruption shall cease and the service shall be restored. This procedure shall be repeated to suit the Owner's working schedule, as many times as required until all work is completed. Any outages of service shall be approved by the Owner, prior to commencing the work. No outages or shutdowns of service shall occur without the written authorization of the Owner, prior to commencing the work. Give notice of any scheduled shutdowns, a minimum of two (2) weeks in advance. The Owner shall make their best efforts to meet this request.

C. Shutdowns shall not be scheduled during normal business hours (i.e., shutdowns shall be from 6:00 PM to 6:00 AM). Maximum duration of each shutdown shall be eight (8) hours, unless otherwise approved by the Owner. Not more than one shutdown per twenty-four 24 hour period, unless otherwise approved by the Owner.

D. The Plumbing Subcontractor shall submit with his bid a preliminary shutdown schedule for review by the Owner, Architect and General Contractor. Shutdown schedule shall be finalized with the successful Plumbing Subcontractor.

E. Prior to any deactivation and relocation or demolition work, consult the drawings and arrange a conference with the Architect and the Owner's representative in the field to inspect each of the items to be deactivated, removed or relocated. Care shall be taken to protect all equipment designated to be relocated and reused or to remain in operation and be integrated with the new systems.

F. Refer to Division 1 for additional requirements for demolition and extension of existing systems.

G. Plumbing Subcontractor shall be responsible to disconnect, make safe and lower to ground all piping, fixtures equipment indicated for removal. Piping and all associated supports shall be removed in their entirety, unless otherwise noted on the drawings. Open ends of piping are not allowed on systems to remain, all piping shall be capped or plugged.

H. Plumbing Subcontractor shall disconnect and make safe all equipment designated for removal by others.

I. All deactivation, relocation and temporary tie-ins shall be provided by the Plumbing Subcontractor. All demolition, removal and the legal disposal of

demolished materials of systems designated to be demolished shall be provided by the General Contractor.

J. The Owner reserves the right to inspect the material scheduled for removal, and salvage any items he deems usable for spare parts.

K. Where existing piping and equipment are embedded in concrete walls, ceilings or floors, the piping shall be cut back flush to the surface, all piping shall be disconnected equipment shall be removed for the General Contractor to patch the existing opening.

1.27 STAGING

A. Refer to Section 015000 – Temporary Facilities and Controls for the requirements of this Section.

1.28 CORE DRILLING

A. The Plumbing Contractor shall be responsible for core drilling all holes (up to and including 12" in size) required for work under his Contract and with the written approval of the Architect.

B. In no case shall the Plumbing Contractor cut into any structural elements without the written approval of the Architect

1.29 PIPE SLEEVES AND ESCUTCHEONS

A. Where pipes pass through all wall or floors, the Plumbing Contractor shall provide and set individual sleeves for each pipe and all other work under his charge, as necessary for passage of all pipes. Sleeves shall be of sufficient size to provide ½ inch air space around the pipe passing through it. All openings shall be sealed, smokeproofed and made tight. The Plumbing Contractor shall be responsible for the exact location of sleeves provided under this Contract and shall coordinate all requirements for piping sleeves.

B. All exposed piping penetration of walls, floors, and ceilings shall be fitted with escutcheons.

C. When plastic piping is used the penetration shall be protected with a fire rated collar to maintain the assembly rating.

1.30 IDENTIFICATION OF MATERIALS

A. All equipment used in the plumbing systems shall have a permanently attached nameplate identifying the manufacturer, service, size, serial number or model number, etc. The nameplates shall be kept clean and readable at all times.

B. Each item of equipment such as pumps, water heaters, grease traps, interceptors, etc., shall be identified by a permanently attached nameplate.

C. A legend showing the service and an arrow indicating the direction of flow shall be applied on each pipe installed by the Plumbing Subcontractor.

1.31 PIPE EXPANSION

A. Furnish and install all necessary expansion compensators, loops, anchors and guides so that no stress is placed on the piping systems or equipment due to thermal expansion.

B. Make proper provision for expansion and contraction in all parts of piping systems by providing expansion joint compensators.

C. Expansion compensator elements shall be as specified herein and shall be selected by the manufacturer to withstand system pressure and temperature conditions and to absorb thermal expansion of the piping. Use of expansion compensators in non-accessible locations shall not be permitted.

D. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

E. Refer to the Vibration Isolation, Seismic Bracing and Hangers and Supports sections of this specification for specific information related to and affecting this Section.

F. Delivery Storage and Handling:

1. All expansion compensators shall be delivered in containers and shall be kept in a dry and protected area.

2. All anchors and guides shall be electro galvanized or stainless steel construction.

G. Do not paint or install expansion compensators, anchors or guides when environmental conditions are outside the specific limitations of the referenced codes and/or manufacturer's recommendations.

1.32 ALTERNATES

A. General

1. Related requirements specified elsewhere:

a. Section 011000 Summary of Work

b. Section 012330 Alternates

B. Description

1. This section describes the changes to be made under each alternate.

2. Alternate proposals shall include the difference in price (addition or deduction) from the base bid, for substitution, omitting or adding to materials or construction required by the Bidding Documents as part of the base bid construction work.

3. The difference in price shall include all omissions, additions, adjustments of all trades as may be necessary because of each change.

4. Coordinate pertinent related work and modify surrounding work as required to complete the project under each alternate designated in the Owner Contractor Agreement.

C. Schedule of Alternates

1. Alternate Bid 1: Drain 5 Pipe Lining

a. Drain 5 pipe on the north end of the building is not functioning properly and requires repairs. This alternative proposes to restore pipe functionality using resin-impregnated liner.

2. Alternate Bid 2: Drain 5 Replacement

a. Drain 5 pipe on the north end of the building is not functioning properly and requires repairs. This alternative proposes to remove and replace the drain and pipe from the roof level to its connection to the existing sewers.

PART 2 – PRODUCTS

2.01 GENERAL

A. All materials submitted for use on this project shall be manufactured in North America unless there is no source of supply available to meet this criteria. Source documentation shall be submitted upon request.

B. All piping, fittings, valves, fixtures, supplies and stops, meters, outlets etc. shall be compliant with the "Reduction of Lead in Drinking Water Act"; NSF 61 section 9 compliant.

C. No materials used in the Plumbing system shall contain asbestos.

D. Products to be used shall be specifically approved by the Commonwealth of Massachusetts Board of State Examiners and Plumbers and Gasfitters for use in Massachusetts.

E. At the request of the Architect submit documentation of this Product Approval for any and/or all products to be used.

2.02 HANGERS AND SUPPORTS

A. All hangers, supports, clamps, rods, hardware etc., shall be corrosion resistant (stainless steel or electro-galvanized) unless specifically listed otherwise herein. All hangers shall be UL listed.

B. All piping, above and below grade, shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grading and sloping of lines, to prevent vibration and to secure piping in place, and shall be so arranged as to provide for expansion and contraction.

C. The Subcontractor shall engage the services of a Professional Engineer registered within the state wherein the project is located to prepare complete Design Drawings and structural design computations based on, and closely following, the design and details on the Drawings. The Design Drawings and structural design computations, with the Engineer's seal affixed thereto, shall be submitted to the Architect for review. The structural design computations shall provide a complete structural analysis, including anchors and fastening devices, and shall certify as to conformation to governing laws and codes. These submittals, upon review, must be sufficient, when taken in conjunction with this Specification to provide the complete basis of the fabrication and erection and attachment for system hangers and supports.

D. Maximum spacing on cast iron pipe shall be 5' and hangers shall be provided at all changes in direction. Hanger rods to support piping from the structure or supplementary steel shall not exceed 4' in total length. Where pipe support assemblies exceed 4' in total length, the Plumbing Subcontractor shall furnish and install factory fabricated channels and associated accessories as approved.

E. Where codes having jurisdiction require closer spacing, the hanger spacing shall be as required by code in lieu of the distances specified herein.

F. Friction clamps shall be installed at the base of all plumbing risers and at each floor level.

1. Friction clamps shall not be supported from or rest on floor sleeves, stack and riser clamps shall be attached to the floor and the building framing to prevent the riser from moving independently of the structure and the floor level that the riser clamp is located on. Clamps on concealed piping shall not be exposed in occupied space.

G. All below slab piping:

1. Shall be supported from the structure/slab above.

2. All hangers and hardware for all below slab (buried) piping shall be fiberglass similar to as manufactured by Aickinstrut.

3. Hangers shall be held fast to the pipe to ensure the rod is perpendicular to the pipe and the slab above.

4. Fabricated channels and frames shall be installed when the piping is more than 48" below the bottom of the slab.

5. The contractor shall witness the proper backfilling of piping and the slab pour to ensure piping is not damaged, proper slope is maintained, openings/connections are not covered up and that hangers are adequately secured to the structure/slab. Backfilling shall be per ASTM F2536.

6. Below slab hangers shall be spaced no more than 48" apart, tighter spacing shall be followed when the hanger loading exceeds the recommendations of the hanger manufacturer.

H. Hangers for all horizontal cast iron piping shall be clevis type hangers. These hangers shall be sized to provide for insulation protectors as hereinbefore specified.

I. Hangers for uncovered (uninsulated) copper piping shall be factory applied plastic coated steel band or copper plated.

J. Where three or more pipes are running parallel to each other, factory fabricated gang type hangers with the pipe saddle clips or rollers may be used in lieu of the hereinbefore specified clevis hangers. These hangers shall be sized to provide for insulation protectors as hereinafter specified. Pipe saddle clips shall be not less than 16-gauge metal and shall be plastic coated when installed with uninsulated copper piping.

K. All vertical drops and runouts, including insulated pipes, shall be supported by extension type split ring type hangers. These hangers shall be plastic coated when used on uncovered copper tubing. Supports on insulated piping shall be sized to fit the outside diameter of the pipe insulation.

L. Field painting or spraying of hangers in lieu of plastic coating will not be accepted.

M. All horizontal piping shall be suspended from the building by mild steel rod connecting the pipe hanger to inserts, beam clamps, angle brackets, and lag screws as required by the Building Construction in accordance with the following:

Copper and Plastic Pipe Size (inches)	Rod Diameter
½″-2″	3/8″
2 ½″-5″	½″
6	5/8″
8″	¾″
10″ and 12″	7/8″

Steel and Cast Iron Pipe Size (inches)	Rod Diameter
½″-2″	3/8″
2 ½″-3 ½″	½″
4″-5″	5/8″
6″-8″	¾″
10″-12″	7/8″
15″	1″

N. All hangers on insulated lines shall be sized to fit the outside diameter of the pipe insulation. Provide pipe covering protection saddles at all hangers on the insulated lines.

O. Remove rust from all ferrous hanger equipment (hangers, rods and bolts) and apply one coat of rust inhibitor which does not contain lead immediately after erection.

P. Piping at all equipment and control valves shall be supported to prevent strains or distortions or transmission of vibration in the connected equipment and control valves. Piping at equipment shall be supported to allow for removal of equipment, valves, and accessories with a minimum of dismantling and without requiring additional support after these items are removed.

Q. All piping installed under this SECTION of the Specification shall be independently supported from the building structure and not from the piping, ductwork, or conduit of other trades. All supplementary steel, including factory fabricated channels, required to meet the requirements specified herein, shall be furnished and installed by the Plumbing Subcontractor.

R. All supplementary steel, including factory fabricated channels and associated accessories throughout the project for this SECTION of the Specifications both suspended and floor mounted shall be furnished and installed by the Plumbing Subcontractor and shall be subject to the approval of the Architect/Engineer. All supplementary steel, hangers and hardware shall be provided as needed to attach the systems and equipment adequately and safely to the building structure as required by the structural engineer.

S. Hanger assemblies (hanger, plates, rods, and screws) installed for chrome plated piping shall also be chrome plated.

T. Safety straps shall be installed with all beam clamps.

U. Thermal expansion of all piping systems shall be accommodated through the offsetting of the piping system where possible and not installing long straight runs of in-line piping.

V. Piping shall be supported on both sides of building expansion joints and listed flexible fittings/flexible connections used to allow for the movement of the building and structure without impact to the piping systems traversing the joint.

W. Hanger attachment

1. This section is a performance specification.

2. All anchors shall be ICC listed for their use.

3. Concrete:

    a. Where new slabs are being poured the hangers shall be supported via imbedded insert boxes or cast-in anchors and not with post installed anchors.

    b. All hangers shall be secured by approved inserts or expansion shields wherever possible and practicable, self-tapping inserts/attachments are not allowed. Inserts and shields shall be UL listed. Drilling where required shall be done by the Plumbing Subcontractor under this SECTION of the Specifications. Powder, explosive or pressure-driven inserts, or powder, explosive or pressure-actuated installation equipment shall not be allowed.

    c. Post-installed anchors shall be as manufactured by Hilti, Powers or Strongtie. Contact the manufacturer for product related questions.

    d. Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances coordinated with the hanger manufacturer and the structural engineer.

    e. Reinforcing bars in the concrete structure may conflict with specific anchor locations. Reinforcing bars shall not be cut under any circumstances. The contractor shall review the structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by hilti ferroscan, gpr, x-ray, chipping or other means.

4. Wood Framing:

    a. Hangers shall be attached using Erico, Powers, Hilti or approved equal wood fastening systems.

5. Anchor capacity used in design shall be based on the technical data published by the manufacturer or such other method as approved by the structural engineer of record.

6. Substitution requests for alternate products must be approved in writing by the structural engineer of record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product.

    a. Substitutions will be evaluated by their having an ICC ESR (Evaluation Services Report) showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions.

7. Install anchors per the manufacturer instructions, as included in the anchor packaging, and per their ICC listing.

8. The contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of their anchoring products specified. The structural engineer of record must receive documented confirmation that all of the contractor's personnel who install anchors are trained prior to the commencement of installing anchors.

X. All below slab piping shall be supported from the slab above as mentioned herein before.

(1) Working pressure.

(a) All Circuit Solvers shall be standard tapered female pipe thread, NPT.

2.03 PIPE MATERIALS

A. Hubless Cast Iron Soil Pipe and Fittings -use for storm conductor lines not buried.

1. Shall be CISPI designated.

2. Hubless cast iron soil pipe ASTM A888. Tyler, Charlotte, AB&I.

3. Standard couplings shall conform to ASTM C 1277 with stainless steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve & bear the NSF Trademark.

    a. Manufacturers

        1) ANACO.

2) Mission Rubber Co.

3) Tyler Pipe; Soil Pipe Div.

4) Pro Flo

5) Ideal

4. Heavy duty couplings shall be Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.

a. Manufacturers:

1) ANACO/Husky SD 4000

2) Clamp-All Corp.-125

5. Pipe sizes up to and including 4" shall have 4 clamps and shall be 3" wide. Pipe sizes 5" and larger shall have 6 clamps and shall be at least 4" wide.

6. Offsets shall be supported by Holdrite thrust restraints (Holdrite 117 or approved equal).

a. Installers shall submit training certificates with the submittal of the restraint and sway bracing system.

B. Cast Iron Soil Pipe and Fittings -use for storm conductor lines buried/below slab.

1. Shall be CISPI designated. Tyler, Charlotte, AB&I.

2. Service weight cast iron pipe ASTM A74, bell and spigot joints with rubber resilient gasket. Tyler, Charlotte, AB&I.

C. PVC Plastic Pipe and Fittings – Above Ground and Buried - storm conductor piping where allowed by code.

1. Schedule 40 PVC, solid core piping and fittings approved by Code.

a. PVC piping shall not be installed below grade when the soil conditions are subject to settling.

All piping serving said areas shall be metallic as specified herein, to a point 10'-0" beyond the building footprint.

2. PVC piping shall not receive waste from a water heater temperature and pressure relief, said piping shall be metallic as specified herein.

3. Shall be solvent cemented with a independent purple primer and solvent solutions.

2.04 INSULATION

A. GENERAL INSULATION REQUIREMENTS

1. All materials shall be installed by skilled labor regularly engaged in this type of work. All materials shall be installed in strict accordance with manufacturer's recommendations, building codes, and industry standards.

2. Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation.

3. On cold surfaces where a vapor seal must be maintained, insulation shall be applied with a continuous, unbroken moisture and vapor retarder. All hangers, supports, anchors, or other projections secured to cold surfaces shall be insulated and vapor sealed to prevent condensation.

4. All pipe insulation shall be continuous through walls, ceiling or floor openings, or sleeves except where firestop or firesafing materials are required.

5. Install multiple layers of insulation with longitudinal and circumferential joints staggered.

6. Scope: The following piping, fittings, and valves shall be insulated:

   a. All interior water piping, including tempered water piping.

   b. Glycol supply and return piping.

   c. All horizontal storm conductor and clear water waste piping including drain bodies except buried piping.

   d. Storm conductor and in exterior furred ceiling spaces and building overhangs.

B. Insulation Materials:

1. Piping insulation, jacketing and accessories

2. Equipment insulation and jacketing or coatings

3. Mastics and Tapes

4. Laminated self-adhesive water and weather seal such as VentureClad

5. PVC fittings and inserts

6. Pre-formed; formaldehyde free glass mineral wool fittings

7. Insulation products shall not contain asbestos, lead, mercury, mercury compounds, or formaldehyde. Products shall be certified by UL GREENGUARD GOLD or Indoor Advantage Gold.

8. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

9. Insulation materials applied to carbon steel shall be Mass Load Corrosion Rate (MLCR) tested per ASTM C 1617.

10. Manufacturers: Knauf Insulation, Proto Corporation, ICA Hamfab, VentureClad, Johns Manville, Certain Teed, Owen Corning or pre-approved substitute.

11. Glass Mineral Wool: Knauf Insulation Earthwool™ 1000° Pipe Insulation with ECOSE® Technology, UL/ULC Classified, EPD Certified by UL Environment. Living Building Challenge – Declare, Red List free for unjacketed Pipe, meeting ASTM C 547 Type IV Grade A, ASTM C 585, ASTM C411 and ASTM C 795; rigid, molded, k value: ASTM C 335, 0.23 at 75°F (0.033 at 24°C) mean temperature. Maximum Service Temperature: 1000°F (538°C). Vapor Retarder Jacket: ASJ+/SSL+ conforming to ASTM C 1136 Type I, II, III, IV, & VIII secured with self-sealing longitudinal laps and matching ASJ+ butt strips. Verified to be formaldehyde free by UL Environment.

12. Glass Mineral Wool: Knauf Insulation Earthwool™ Redi-Klad® 1000° Pipe Insulation with ECOSE® Technology, Component FHC 25/50 per ASTM E 84, EPD Certified by UL Environment. Living Building Challenge – Declare, Red List free, meeting ASTM C 547 Type IV Grade A, ASTM C 585, ASTM C411 and ASTM C 795; rigid, molded; k value: ASTM C 335, 0.23 at 75° F

(0.033 at 24° C) mean temperature. Maximum Service Temperature: 1000° F (538° C). Redi-Klad Jacket: VentureClad 5-ply weather and abuse resistant with self-seal lap. Zero permeability per ASTM E 96-05; puncture resistance 35.4 kg (189.3 N) per ASTM D 1000; tear strength 4.3 lb. (19.4 N) per ASTM D 624; thickness 14.5 mils (0.0145"); tensile strength 68.0 lb./inch width [306 N (31 kg)/25 mm].

13. Glass Mineral Wool: Knauf Pipe & Tank Insulation with ECOSE® Technology; semi-rigid, limited combustible meeting requirements of ASTM C 1393; NRC 1.36; ASTM C 795, ASTM C447 and MIL-I-24244C. k value: ASTM C 177, 0.25 at 75° F (0.036 at 24°C) mean temperature. Maximum Service Temperature: 850°F (454°C). Compressive Strength: not less than 120 PSF (5.75 kPa) @ 10% deformation per ASTM C 165. Vapor Retarder Jacket: ASJ conforming to ASTM C 1136 Type II, FHC 25/50 per ASTM E 84.

14. Glass Mineral Wool: Knauf KwikFlex™; semi-rigid glass mineral wool blanket in roll form , UL/ULC Classified ASJ and FSK; FHC 25/50 per ASTM E 84 PSK only; meeting requirements of UL 723, ASTM C 1393, ASTM C447 and ASTM C 356. k value: ASTM C 518, 0.24 at 75° F (0.035 at 24°C) mean temperature. Maximum Service Temperature: 850°F (454°C); maximum surface temperature for faced product: 150° F (66° C); maximum thickness @ 850° F: 4 inches (102 mm). Compressive Strength: not less than 25 PSF (1.2 kPa) @ 10% deformation per ASTM C 165. Vapor Retarder Jacket: ASJ, FSK or PSK conforming to ASTM E 96, Procedure A.

15. Fitting Insulation: Insulate using pre-formed PVC fitting covers with glass mineral wool inserts. Alternatively, preformed molded, formaldehyde free glass mineral wool; minimum 50% post-consumer recycled glass content, or mitered glass mineral wool pipe insulation sections. These fittings shall be further protected by field-applied PVC fitting covers, metal fitting covers, or glass fabric and mastic sealed as necessary.

C. All insulation and jacketing/fittings located in air plenums shall be smoke-proof and non-combustible, in compliance with the flame and smoke spread ratings of ASTM E84 (plenum rated).

D. Insulation Thickness:

1. The piping, fittings, and valves shall be insulated per the following (minimum R value of 3.0):

a. Horizontal storm water conductors: insulation shall be 1" thick and have a thermal conductivity not exceeding 0.27 Btu per inch/hr • ft^2 •°F. (R 3.7). Where the piping turns vertical within 30 feet of the drain or receptor the vertical portion shall also be insulated down to the first penetration through the floor.

E. Finish

1. Exposed: Same as concealed except all insulation shall have factory applied 8 ounce canvas finish or pre-sized glass cloth jacket.

2. ASJ Fiberglass 24 All Service Jacket.

3. Piping and fittings exposed to the elements or not concealed shall have PVC jacket applied over the factory applied 8 ounce canvas finish or pre-sized glass cloth jacket.

4. Factory Applied Jackets

a. ASJ+/SSL+: All service jacket with Advanced Closure System self-sealing lap. All Service Jacket composed of aluminum foil reinforced with glass scrim bonded to a kraft paper interleaving with an outer film layer leaving no paper exposed.; conforming to ASTM C 1136 Type I, II, III, IV, and VIII; vapor retarder; with a self-sealing adhesive.

b. ASJ: All service jacket. White kraft paper bonded to aluminum foil and reinforced with glass fibers; conforming to ASTM C 1136; vapor retarder.

c. FSK: Foil scrim kraft. Aluminum foil, fiberglass reinforced scrim with kraft backing; conforming to ASTM C 1136 Type 1; vapor retarder.

d. PSK: Poly scrim kraft. Metalized polypropylene, fiberglass reinforced scrim with kraft backing; conforming to ASTM C 1136 Type 1; vapor retarder.

e. Redi-Klad Jacket: VentureClad 5-ply weather and abuse resistant with self-seal lap, Living Building Challenge – Declare, Red List free. Zero permeability per ASTM E 96-05; puncture resistance 35.4 kg (189.3 N) per ASTM D 1000; tear strength 4.3 lb. (19.4 N)

per ASTM D 624; thickness 14.5 mils (0.0145"); tensile strength 68.0 lb./inch width [306 N (31 kg)/25 mm].

f. Fire Retardant: products shall contain no polybrominated diphenyl ethers (PBDE) such as Penta-BDE, Octa-BDE or Deca-BDE; whenever available.

5. Field Applied Jackets

a. PVC: Proto Corporation 25/50 or Indoor/Outdoor, UV resistant fittings, jacketing and accessories, white or colored. Fitting cover system consists of pre-molded, high-impact PVC materials with glass mineral wool inserts. Glass mineral wool insert has a thermal conductivity (k value) of 0.26 at 75° F (0.037 at 24°C) mean temperature. Closures: stainless steel tacks, matching PVC tape, or PVC adhesive per manufacturer's recommendations.

b. Aluminum Jacket: Alloy 3003 or 3105, minimum thickness per ASTM C 1729, smooth, corrugated or stucco embossed with factory-applied moisture barrier. Overlap shall be 2 inch (50 mm) minimum. Jacket shall be banded in place with ½" x 0.20" aluminum strapping fastened with aluminum wing seals.

c. Stainless Steel Jacket: T-304, minimum per ASTM C 1729, smooth, corrugated or embossed with factory-applied moisture barrier. Overlap shall be 2 inch (50 mm) minimum. Jacket shall be banded in place with ⅜" x 0.20" aluminum strapping fastened with stainless steel wing seals.

d. Laminated Self-Adhesive Water and Weather Seals: permanent acrylic self-adhesive system; weather resistant, high puncture and tear resistance; meeting or exceeding requirements of

e. UL 723; and applied in strict accordance with manufacturers' recommendations.

f. Fire Retardant: products shall contain no polybrominated diphenyl ethers (PBDE) such as Penta-BDE, Octa-BDE or Deca-BDE; whenever available.

F. Application:

1. General

a. All insulation shall be installed in strict accordance with the manufacturer's recommendations and shall be applied by a qualified Insulation subcontractor.

b. Insulation shall not be applied on any apparatus or piping until the apparatus and piping have been thoroughly cleaned, tested and accepted as tight.

2. Piping: Pipe insulation where vapor barrier jacket is required, shall be installed with vapor barrier jackets drawn tight and firmly sealed to assure a positive vaporseal. End joints shall be covered with 4-inch wide butt strips of material identical to vapor barrier jackets, and they shall be drawn tight and securely sealed. The use of staples, bands, etc., to secure insulation where vapor barrier jacket is required will not be acceptable. Pipe insulation where no vapor barrier is required shall be secured with flare type staples.

3. Fittings and Valves: Cement or moulded insulation on fittings and valve bodies shall be same thickness as adjacent covering and finished neatly to match the adjacent pipe insulation.

G. Hangers

1. Special high density inserts of calcium silicate, cellular glass and other approved material of the same thickness as adjacent insulation shall be installed at points of hanger support. Insulation inserts shall be installed at points of hanger support. Insulation inserts shall be either 180 degrees or 260 degrees and not less than 18" in length. The entire insert shall be covered with a vapor barrier facing of the same appearance and quality as the facing on the adjacent covering.

2. Insulation at hangers, anchors and supports shall be neatly cut and fitted.

3. In Lieu of #2 and #3 above: Snappitz: self locking insulated pipe supports. Insulated Pipe Supports may be provided at hanger, support, and guide locations on pipe requiring insulation. The insert should consist of either Hydrous Calcium Silicate or Polyisocyanurate Foam Insulation (Urethane) encircling the entire circumference of the pipe with a 360° galvanized steel jacket and installed during the installation of the piping system.

H. MASTICS

1. Vapor Retarder Mastics:

a. Knauf Insulation EXPERT Mastics: KI-900 ASJ or KI-905 ASJ+

b. Water Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.04 perm (0.026 metric perm) at 40 mil dry film thickness.

c. Service Temperature Range: -20°F to 180°F (-29°C to 82.2°C).

d. Color: White

2. Weather Barrier Mastics:

a. Knauf Insulation EXPERT Mastics: KI-700 ASJ or KI-705 ASJ+

b. Water Vapor Permeance: ASTM F 1249, 1.8 perm (1.2 metric perm)

c. Service Temperature: 0°F to 180°F constant (-17.8°C to 82.2°C); -20°F to 200°F intermittent (-29°C to 93°C)

d. Solids: 58% by weight; 50% by volume

e. Color: White

I. TAPES

1. ASJ Tapes:

a. Knauf Insulation EXPERT Tapes: ASJ Tape or ASJ+ Tape

b. Width: 3 inches (75 mm) or 4 inches (101.6 mm)

c. Thickness (Total): 14.3 mil (0.36 mm) – ASJ; 13.3 mil (0.34 mm) – ASJ+

d. Adhesion: >4.8 Lbf / in. (840 N / m)

2. FSK Tape:

a. Knauf Insulation EXPERT Tapes: FSK Tape

b. Width: 3 inch (75 mm) or 4 inch (101.6 mm)

c. Thickness (Total): 13.3 mil (0.34 mm)

d. Adhesion: 6.5 Lbf / in. (1138 N / m)

3. Aluminum Foil Tape:

   a. Knauf Insulation EXPERT Tapes: 2 Mil Foil Tape

   b. Width: 3 inch (75 mm) or 4 inch (101.6 mm)

   c. Thickness (Total): 7.3 mil (0.19 mm)

   d. Adhesion: 4.0 Lbf / in. (700 N / m)

2.05 PENETRATION FIRESTOPPING

A. Performance Requirements

1. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.

   a. Fire-resistance-rated load-bearing walls, including partitions, with fire protection-rated openings.

   b. Fire-resistance-rated non-load-bearing walls, including partitions, with fire protection-rated openings.

   c. Fire-resistance-rated floor assemblies.

   d. Fire-resistance-rated roof assemblies.

2. Rated Systems: Provide penetration firestopping systems with the following ratings determined per ASTM E 814 or UL 1479:

   a. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

   b. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect

penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

1) Penetrations located outside wall cavities.

2) Penetrations located outside fire-resistance-rated shaft enclosures.

3) Penetrations into storage areas containing combustible materials.

3. L-Rated Systems: Where through-penetration firestop systems are indicated in smoke barriers, provide through-penetration firestop systems with L-ratings of not more than 3.0 cfm/sq. ft (0.01524cu. m/s x sq. m) at both ambient temperatures and 400 deg F (204 deg C).

   a. Utilize Hilti CP653 Speed Sleeve Cable Pathway Device with appropriate system to achieve L-Rating

4. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.

   a. For piping penetrations for plumbing systems, provide moisture-resistant through-penetration firestop systems.

   b. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.

   c. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

5. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

6. Systems and Product Selection:

a. It is the Installing Contractor's undivided responsibility to select proposed systems and products which are appropriate for the types of penetrations, construction systems and the required fire resistance ratings shown on the Drawings and which comply with the requirements of this specification, subject to review by the Architect.

b. Proprietary products and UL designs when indicated on the Drawings are not intended to imply that products and UL designs of the manufacturer are required to the exclusion of equivalent products of other named acceptable manufacturers.

B. Manufacturers

1. Regional Materials: Provide a minimum of 20 percent of building materials (by cost) that are regionally extracted, processed and manufactured materials within a radius of 500 miles.

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Basis of Design: Hilti Inc.

b. 3MFire Protection Products, Inc., St. Paul, MN 55144

c. Dap Inc., Dayton, Oh 45401

d. Flamesafe - W.R. Grace & Co., Hatfield, PA 19440

e. Johns Manville.

f. Nelson Firestop Products, Tulsa, OK 74145

g. NUCO Industries, Lake Forest, IL 60045.

h. The RectorSeal Corporation, Houston, TX 77023.

i. Specified Technologies Co., Sommerville, NJ 08876.

j. Tremco, Inc.; Cleveland, OH 44104.

k. USG Corporation, Chicago, IL.

C. Penetration Firestopping

1. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

2. All floor penetrations shall resist the passage of water by either a raised sleeve or the use of waterproof sealants.

   a. W-Rating: Shall resist the passage of water. Insulated piping shall be wrapped with a waterproof jacket to prevent the water from flowing through the insulation.

      1) Utilize Hilti CP680-M/P Water Barrier Module with appropriate system to achieve W-Rating

3. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

   a. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls, and fire partitions.

   b. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

4. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

   a. Horizontal assemblies include floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

   b. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.

c. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

d. T-ratings shall be achieved by utilizing a Low Bio Persistent Endothermic Mat incorporating foil scrim on both sides

1) Basis of Design: Hilti CFP-ES Endo-Shield Low Bio Persistent Endothermic Mat with foil scrim on both sides. LBC Red list Compliant.

e. W-Rating: Shall resist the passage of water. Insulated piping shall be wrapped with a waterproof jacket to prevent the water from flowing through the insulation.

1) Utilize Hilti CP680-M/P Water Barrier Module with appropriate system to achieve W-Rating

5. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.

6. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

7. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Sealants: 250 g/L.

b. Sealant Primers for Nonporous Substrates: 250 g/L.

c. Sealant Primers for Porous Substrates: 775 g/L.

8. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

a. Permanent forming/damming/backing materials, including the following:

1) Semirefractory -fiber or slag/rock-mineral wool-insulation.

2) Ceramic fiber.

3) Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.

4) Fire-rated form board.

5) Joint Fillers for joint sealants.

b. Temporary forming materials.

c. Substrate primers.

d. Collars.

e. Steel sleeves.

D. Mixing

1. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

E. Materials

1. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

2. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products or equals are acceptable:

3. Cast-In Place Firestop Device (CP 680-P)

4. Add Aerator Adaptor when used in conjunction with aerator system.

5. Tub Box Kit (CP 681) for use with tub installations.

6. Cast-In Place Firestop Device (CP 680-M / CFS CID MD) for use with noncombustible penetrants.

7. Firestop Speed Sleeve (CP 653) for use with cable penetrations.

8. Firestop Retrofit Sleeve Kit (CFS-SL RK) for firestopping existing cable applications

9. Firestop Drop-In Device (CFS-DID) for use with noncombustible and combustible penetrants.

10. Hilti Firestop Block (CFS-BL)

11. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

    a. Intumescent Firestop Sealant (FS-ONE MAX)

    b. Fire Foam (CP 620)

    c. Flexible Firestop Sealant (CP 606)

    d. Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

    e. Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

12. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

a. Silicone Sealant Gun Grade (CFS-S SIL GG)

b. Flexible Firestop Sealant (CP 606)

c. Intumescent Firestop Sealant (FS-ONE MAX))

13. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.

a. Speed Plugs (CP 777)

b. Speed Strips (CP 767)

14. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

a. Intumescent Firestop Sealant (FS-ONE MAX))

15. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:

a. Intumescent Firestop Sealant (FS-ONE MAX))

b. Fire Foam (CP 620)

c. Flexible Firestop Sealant (CP 606)

d. Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

e. Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

16. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:

a. Firestop Putty Stick (CP 618)

b. Firestop Plug (CFS-PL)

17. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

a. Firestop Putty Pad (CFS-P PA)

b. Firestop Putty Pad (CP 617)

c. Firestop Box Insert

18. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

a. Firestop Collar (CP 643N)

b. Firestop Collar (CP 644)

c. Wrap Strips (CP 648E/648S)

19. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

a. Firestop Mortar (CP 637)

b. Firestop Block (CFS-BL)

c. Fire Foam (CP 620)

d. Firestop Board (CP 675T)

20. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

a. Firestop Block (CFS-BL)

b. Firestop Board (CP 675T)

21. Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating gypsum or masonry walls, the following products are acceptable:

a. Firestop Speed Sleeve (CP 653) with integrated smoke seal fabric membrane.

b. Firestop Sleeve (CFS-SL SK)

c. Retrofit Sleeve (CFS-SL RK) for use with existing cable bundles.

d. Gangplate (CFS-SL GP) for use with multiple cable management devices.

e. Gangplate Cap (CFS-SL GP CAP) for use at blank openings in gangplate for future penetrations

22. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:

a. CFS-BL Firestop Block

b. CFS-PL Firestop Plug

23. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

24. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

2.06 PIPE EXPANSION AND MOVEMENT COMPENSATION

A. Engineering Services

1. The Contractor shall submit shop drawings with calculations (with P.E. stamp) detailing the proposed anchor locations for review prior to purchase or installation.

2. All anchor details and forces shall be submitted to the project structural engineer for review prior to any installation, this can be submitted as a part of the vibration isolation and seismic bracing submittal.

B. General

1. Provide expansion joint compensators and securely anchor all piping utilizing expansion loops and joints to the building structure with steel angles, properly braced and attached or welded to the pipe.

2. Compensation shall include building settlement from the time of installation through the life of the building: expected design building settling.

3. Compensation shall include non-seismic related building sway do to loading/unloading and wind forces.

4. Furnish and install thermal expansion compensators for:

   a. PVC waste stacks and connections to stacks (portions that may move with respect to each other)

   b. PVC storm stacks and connections to stacks (portions that may move with respect to each other)

5. Furnish and install building movement compensators for:

   a. All piping systems subjected to building settling and building movement (sway).

   b. Compensators shall be installed on every other floor in concrete construction.

   c. Compensators shall be installed on every floor in wood framed construction.

   d. Where piping ties into vertical stacks and risers, connections shall be made to prevent the piping from shearing off due to the movement of the riser independent of the floor level in the building.

6. Acceptable manufacturers subject to compliance with the specifications shall be as follows:

   a. Guides

      1) Metraflex

      2) Keflex, Inc.

      3) Robertshaw-Fulton

      4) Senior Flexonics Pathway

      5) PHD Manufacturing, Co.

   b. Constant Force Hangers

      1) ANVIL International, Inc.

      2) Piping Technology & Products Inc.

      3) Piping Accessories, Inc.

      4) Rilco Manufacturing Co.

   c. Flexible Expansion Loop

      1) Metraflex (Metraloop)

      2) Flexonics

      3) Adsco

      4) American BOA

PART 3 - EXECUTION

3.01 COOPERATION AND WORK PROGRESS

A. The Plumbing work shall be carried on under the usual construction conditions, in conjunction with all other work at the site. The Plumbing Subcontractor shall cooperate with the Architect, General Contractor, all other Subcontractors and equipment suppliers working at the site. The Plumbing Subcontractor shall coordinate the work and proceed in a manner so as not to delay the progress of the project.

B. The Plumbing Subcontractor shall coordinate his work with the progress of the building and other Trades so that he will complete his work as soon as conditions permit and such that interruptions of the building functions will be at a minimum. Any overtime hours worked or additional costs incurred due to lack of. or improper coordination with. other Trades or the Owner by the Plumbing Subcontractor, shall be assumed by the Plumbing Subcontractor without any additional cost to the Owner.

C. The Plumbing Subcontractor shall furnish information on all equipment that is furnished under this Section but installed under another Section to the installing Subcontractor as specified herein.

D. The Plumbing Subcontractor shall provide all materials, equipment and workmanship to provide for adequate protection of all electrical equipment during the course of construction of the project. This shall also include protection from moisture and all foreign matter. The Plumbing Subcontractor shall also be responsible for damage which he causes to the work of other Trades, and he shall remedy such injury at his own expense.

E. Waste materials shall be removed promptly from the premises. All material and equipment stored on the premises shall be kept in a neat and orderly fashion. Material or equipment shall not be stored where exposed to the weather. The Plumbing Subcontractor shall be responsible for the security, safekeeping and damages, including acts of vandalism, of all material and equipment stored at the job site.

F. The Plumbing Subcontractor shall be responsible for unloading all equipment and materials delivered to the site. This shall also include all large and heavy items or equipment which require hoisting. Consult with the General Contractor for hoisting/crane requirements. During construction of the building, the Plumbing Subcontractor shall provide additional protection against moisture, dust accumulation and physical damage of the equipment. This shall include furnishing and installing temporary heaters within these units, as approved, to evaporate excessive moisture and ventilate it from the room, as may be required.

G. It shall be the responsibility of the Plumbing Subcontractor to coordinate the delivery of the equipment to the project prior to the time installation of equipment will be required; but he shall also make sure such equipment is not delivered too far in advance of such required installation, to ensure that possible damage and deterioration of such equipment will not occur. Such equipment stored for an excessively long period of time (as determined in the opinion of the

Architect) on the project site prior to installation may be subject to rejection by the Architect.

H. The Plumbing Subcontractor shall erect and maintain, at all times, necessary safeguards for the protection of life and property of the Owner, Workmen, Staff and the Public.

I. Prior to installation, the Plumbing Subcontractor has the responsibility to coordinate the exact mounting arrangement and location of equipment to allow proper space requirements. Particular attention shall be given in the field to group installations. If it is questionable that sufficient space, conflict with the work of other Subcontractors, architectural or structural obstructions will result in an arrangement which will prevent proper access, operation or maintenance of the indicated equipment, the Plumbing Subcontractor shall immediately notify the Contractor and not proceed with this part of the Contract work until definite instructions have been given to him by the Architect.

J. The Plumbing Subcontractor shall not allow any of his equipment or piping foreign to the electrical installation to be installed or pass through any room in which electrical systems or equipment are located, such as electric rooms, electric closets, telephone or data closets. The Plumbing Subcontractor shall immediately remove any such piping or equipment.

K. Piping shall not be installed over any electrical equipment; electrical panels, VFD controllers, disconnects, switches, control panels, fire alarm panels, etc. The locations of all equipment shall be coordinated prior to installation so piping systems will not coincide with the locations of any electrical equipment.

L. The Plumbing Subcontractor shall obtain from the Electrical and HVAC Subcontractors all shop drawing prints showing the ductwork piping and conduit installation as they will be put in place on the project. These drawings shall be thoroughly checked by the Plumbing Subcontractor and the routing of all piping and installation of all valves, etc., and plumbing equipment shall be coordinated with the ductwork and conduit so as to prevent any installation conflict. Such coordination shall be done prior to roughing in piping and equipment.

M. Location of all fixtures shall be verified with the Architect prior to roughing. Refer to details and wall elevations on the Architectural drawings. Mounting heights indicated on these drawings and/or specific dimensional information given to the Plumbing Subcontractor by the Architect shall take precedence over such information indicated on the Plumbing drawings.

N. Refer to all other drawings associated with this project. Any and all equipment which require plumbing services or connections, whether indicated on the Plumbing drawings or not, shall be furnished and installed as directed by the Architect.

O. Refer to the Architectural drawings for areas in which the concrete slab is poured on grade. In these areas a waterproofing membrane will be installed on the grade fill or earth prior to pouring of slab. Plumbing piping shall be installed to avoid the necessity of penetrating this waterproofing membrane. Penetration of the membrane, if required, shall only be made when specifically allowed by the Architect, and shall be made only at locations directed by the Architect.

3.02 INSTALLATION

A. General

1. Unless specifically noted or indicated otherwise, all equipment and material specified in 220000 of this specification or indicated on the drawings shall be installed under this Contract whether or not specifically itemized herein. This Section covers particular installation methods and requirements peculiar to certain items and classes or material and equipment.

2. The Plumbing Subcontractor shall obtain detailed information from manufacturers of equipment as to proper methods of installation.

3. Access to any and all components requiring servicing, adjustment, calibration, maintenance or periodic replacement shall be provided so that the Owner's operations personnel can freely gain access without removal of any materials other than the access panel or ceiling tile. Access shall be understood to mean free, clear and unobstructed from the floor up to the device and/or component being serviced.

4. The Plumbing Subcontractor shall obtain final roughing dimensions and other information as needed for complete installation of items furnished under other Sections or furnished by the Owner.

5. The Plumbing Subcontractor shall keep fully informed of size, shape and position of openings required for material and equipment provided under this and other Sections. Ensure that openings required for work of this Section are coordinated with work of other Sections. Cutting and patching by others as necessary.

6. The Plumbing Subcontractor shall coordinate the utility service installations with the CM, the owner, Sewer Department Utility Co..

7. All miscellaneous hardware and support accessories, including support rods, nuts, bolts, screws and other such items, shall be of a galvanized or cadmium plated finish or of another approved rust-inhibiting coating.

3.03 MATERIALS AND WORKMANSHIP

A. All materials and equipment shall be new and unused and shall meet requirements of the latest Standards of NEMA, UL, ANSI and ASTM. Equipment shall have components required or recommended by OSHA, applicable NFPA documents and shall be UL listed and labeled.

B. Despite references in the specifications or on the drawings to materials or pieces of equipment by name, make or catalog number, such references shall be interpreted as establishing standards of quality for materials and performance.

C. Finish of materials, components and equipment shall not be less than Industry good practice. When material or equipment is visible or subject to corrosive or atmospheric conditions, the finish shall be as approved by the Architect.

D. Provide proper access to material or equipment that requires inspection, replacement, repair or service. If proper access cannot be provided, confer with the Architect as to the best method of approach to minimize effects of reduced access.

E. All work shall be installed in a neat and workmanlike manner and shall be done in accordance with all Local and State Codes.

F. The Owner will not be responsible for material, equipment or the installation of same before testing and acceptance.

3.04 FIRESTOPPING

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Preparation

1. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop systems manufacturer and the following requirements:

    a. Remove from surfaces of openings substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.

    b. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.

    c. Remove laitance and form-release agents from concrete.

2. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contactor by cleaning methods used to remove smears from firestop systems materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

D. Through-Penetration Firestop System Installation

1. General: Install through-penetration firestop systems to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

2. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies or support live load and traffic. Installer shall consult structural engineer prior to penetrating any load bearing assembly.

3. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

    a. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

4. Install fill materials for firestop systems by proven techniques to produce the following results:

    a. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

    b. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

    c. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

E. Field-Quality Control

1. Inspecting Agency: Owner will engage a qualified (meets ASTM E699 and ASTM E3038-16 Standards) independent inspecting agency to inspect through-penetration firestop systems and to prepare test reports.

    a. Inspecting agency will state in each report whether inspected through-penetration firestop systems comply with or deviate from requirements.

    b. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops” or other recognized standard

2. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued.

3. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

4. Manufacturer's Field Services: Contractor to ensure a manufacture's direct representative is on-site during installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Training wil be done per manufacturer's written recommendations published in their literature and drawing details.

F. Identification

1. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels.

a. The words: "Warning-Through-Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."

b. Contractor's name, address, and phone number.

c. Through-penetration firestop systems designation of applicable testing and inspecting agency.

d. Date of installation.

e. Through-penetration firestop systems manufacturer's name.

f. Installer's name.

G. Cleaning And Protection

1. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

2. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

H. Firestop System Schedule

1. Install firestop materials for through penetrations in fire rated assemblies in accordance with the following schedule of approved firestop systems:

2. Firestop Systems – Through Penetration Schedule. Provide a schedule of all firestop systems to be used, similar to the following as applies to this specific installation:

Penetrating Item	**Concrete Floor/Wall or Block Wall**	**Gypsum Wall**	**Gypsum Shaft Wall**
Blank Opening	F-A-0012, F-A-0014		
Metal Pipe	C-AJ-1149, C-AJ-1291, C-AJ-1226, F-A-1016, F-A-1017, F-A-1192	W-L-1054, W-L-1297, W-L-1441	W-L-1206, W-L-1380
Plastic Pipe	C-AJ-2567, F-A-2053, F-A-2054, F-A-2066, F-A-2058, F-A-2310	W-L-2128, W-L-2541, W-L-2078	W-L-2292
Cable Bundle	C-AJ-3180, C-AJ-3095, F-A-3007, F-A-3033, C-AJ-3298, C-AJ-3285, C-AJ-3345, F-A-3071	W-J-3060, W-L-3065, W-L-3335, W-L-3395, W-L-3396, W-L-3414,	W-L-3161, W-L-3278

		W-L-3415, W-L-3393	
Metal Pipe with Glass-fiber Insulation	C-AJ-5091, C-AJ-5096, F-A-5017, F-A-5070, F-A-5018, F-B-5004	W-L-5029, W-L-5257, W-L-5274	W-L-5244
Metal Pipe with AB/PVC Insulation	C-AJ-5090, C-AJ-5098, F-A-5015, F-A-5069, F-B-5004	W-L-5028, W-L-5027	W-L-5143
Sheet Metal Duct (Rectangular)	C-AJ-7051, C-AJ-7111, C-AJ-7046, C-AJ-7195	W-L-7155	
Sheet Metal Duct (Round)	C-AJ-7084, W-J-7022, F-A-7018	W-L-7042, W-L-7198	
Multiple Penetrants	C-AJ-8099, F-A-1022, F-A-1023, F-A-8016, C-AJ-8143, C-AJ-8110	W-L-8071, W-L-8079, W-L-8035, W-L-8014, W-L-8105, W-L-8086	

3.05 CLEANING

A. This Section of the specifications shall include the cleaning of all equipment on a day-to-day basis and final cleaning of all fixtures, materials and equipment prior to turning building over to the Owner. All necessary cleaning shall be performed to the satisfaction of the Architect, using materials compatible with the surfaces being cleaned.

3.06 FINAL INSPECTION

A. When all Plumbing work on the project has been completed and is ready for final inspection, such an inspection shall be made. At this time, and in addition to all other requirements in the Contract Documents, the Plumbing Subcontractor, for the work under this Contract, shall demonstrate that the requirements of these

specifications have been met to the Architect's satisfaction prior to final payment being made.

3.07 SUBMITTAL AND SHOP DRAWING CHECKLIST

A. The following is a checklist of job specific items that shall be submitted as Shop Drawings by the Plumbing Sub-Contractor for review and approval by Engineer, Architect and Owner.

B. For all piping system materials, components, fittings, etc. submit a schedule of materials and designate on each submittal what system that pipe, valve, or fitting will be used for.

C. The shop drawing submittals shall contain but not be limited to the information as stated below AND as stated in each specification section.

Specification Section	Product/Category	Submittal Requirements	Submitted By Contractor
220000	Plumbing shop drawings	-All below slab piping with invert elevations shown, coordinated with structure and connections to the civil engineer's systems.	
220000	Plumbing shop drawings	-All gas fired equipment venting and combustion air piping layouts, reviewed by the manufacturer for installation requirements.	
220000	Coordination Drawings	-Full set of coordination drawings indicating areas of conflict and proposed solution(s).	
220000/ 083113	Access Doors	-Drawings with locations and sizes	
220000	Preliminary Shutdown Schedule for Demolition Work	-Schedule of shutdowns coordinated with all trades and approved by the Owner.	
220000	Piping	-Cut sheets of all items and schedule of materials including joining methods	

Specification Section	Product/Category	Submittal Requirements	Submitted By Contractor
220000	Identification	-Cut sheets of all items and materials	
220000	Hangers and Supports	-Cut sheets of all items and materials	
220000/ 078413	Firestopping and Smokestopping	-Cut sheets of all items and materials -Schedule of materials and UL listings for each penetration -Engineering Judgments from the manufacturer	
220000	Testing Reports	-Testing report including procedure and results for each system or section of each system. Include multiple iterations as performed.	
220000	Record As-Built Drawings	-Full set of drawings indicating As-Built conditions.	

3.08 VERIFYING CONDITIONS

A. The Plumbing Contractor shall verify all conditions and take all measurements in the field as required to insure that all work will fit actual conditions. Field corrections to fabricated work and adjustments to adjacent work where required for the proper installation of the work will be subject to the Architect's approval. Such corrections and adjustments will be permitted only when they will not be detrimental to the appearance and function of all the work.

3.09 SYSTEM SHUTDOWNS (Existing Buildings)

A. The Plumbing Contractor shall coordinate any and all shutdowns of the existing systems to which he is to connect to. Give proper notice to the Owner when making shutdowns, a minimum of fourteen full days are required. Minimize shutdowns on the and Plumbing systems as much as possible. Provide temporary services where required and perform shutdowns and tie ins at a time convenient to the Owner. The Plumbing Contractor shall be responsible for completing the filing of the Owners shutdown notice questionnaire.

B. Perform all required survey and inspection work required by the notice for shutdown.

C. Operation of valves shall be by the Owner.

3.10 TESTING OF PIPING SYSTEMS

A. General

1. All piping systems shall be subjected to testing water as noted and shall hold tight at the pressure head stated for the time interval required without adding air or water. While any system is being tested, required head or pressure shall be maintained until all joints are inspected.

2. All tests shall be witnessed by the inspector having jurisdiction and the Architect/Engineer, with 48-hour notice given these authorities.

3. All equipment, material and labor required for testing any of the various systems or any part thereof shall be furnished by this Plumbing Subcontractor including all additional restraints and supports required.

4. All testing reports shall be submitted for record and for review as a part of the submittal process.

5. At no time shall a plastic piping system be pressure tested with air or any other compressed gas.

B. Storm Water Systems:

1. Water test shall be applied to these drainage systems either in their entirety or in sections as required, after piping has been installed.

a. If applied to the entire system, all openings in the piping system shall be tightly closed, except the highest opening, and the system filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly closed except the highest opening in the section under test, and each section shall be filled with water but no section shall be tested with less than a 10' head of water.

b. In testing successive sections at least the upper 10' of the next preceding section shall be tested so that no joint of piping in the building, except the uppermost 10' of the system, shall be submitted to a test of less than a 10' head of water. The water

shall be kept in the system for at least 15 minutes before inspection starts; the system shall then be made tight at all points.

2. Any points of the drainage systems to be tested with air instead of water shall be made by attaching an air compressor testing apparatus to any suitable opening and after closing all other inlets or outlets, forcing air into the systems until there is a uniform gauge pressure of 5 psi or sufficient to balance a column of mercury 10" high. This pressure shall be held without the introduction of additional air for a period of at least 15 minutes.

3.11 SUBCONTRACTOR'S CERTIFICATE OF COMPLETION

A. The following Contractor Certificate of Completion sheet shall be copied on to the Contractor's letterhead, filled out, Singed by the Licensed Permit Holder and sealed by an Authorized Officer of the Corporation then submitted to the Architect for Final Certificate of Occupancy. This is per 780 CMR 107.6.3.

SUBCONTRACTOR'S CERTIFICATE OF COMPLETION

PROJECT _____

PERMIT NO. _____ TYPE _____

The undersigned permit holder attests that the _____ scope as installed, is complete and to the best of his knowledge and belief, in substantial accord with the requirements of the Contract Documents and all applicable local, state and federal statutes and regulations.

By: _____ _____
Signature of License holder date

_____ _____
Printed or Typed Name License Number

(seal)

By: _____ _____
Authorized Corporate Officer's Signature date

_____ _____
Printed or Typed Name Title

3.12 DOCUMENTS REQUIRED FOR FINAL AFFIDAVITS

A. These items are required prior to any FINAL AFFIDAVIT being issued to a contractor. All life safety and code issues must be confirmed as completed.

B. The following documents shall be provided on to the Contractor's letterhead, filled out, Singed by the Licensed Permit Holder and sealed by an Authorized Officer of the Corporation then submitted to the Architect for Final Certificate of Occupancy

1. All Code related punch list items have been addressed and signed-off by contractor

2. Plumbing Sub-Contractor Record of Completion

3. Letter from contractor stating that all fire safing is complete for all floor and wall penetrations.

4. As-builts provided and certified as accurate by the contractor and the CM to the owners approval.

5. Operation and maintenance manuals as required in the project specifications.

6. Additional letters as required by the Engineer of record, at no additional cost to the project or the owner.

3.13 SITE VISITS AND FIELD REPORTS

A. The engineer shall make visits to the site at intervals as coordinated with the architect and the owner to observe the installation of systems and status of the construction.

B. Site visits shall not be construed as an exhaustive or continuous on-site inspection or to be considered all-inclusive. The observations identified during visits are not intended to indicate that RWS has observed all the work for conformance to the contract documents and should not be construed as indicating that the construction is complete or correct. The field report list(s) do not contain any hidden defects (not in plain sight) and RWS shall not be responsible for such.

C. RWS reserves the right to re-observe portions of the project and may find additional deficiencies. This is only a cursory observation and does not in any way

relieve the General Contractor of their obligation to insure that construction is in accordance with all local and federal codes and the contract documents including plans, specifications and all of the project requirements.

3.14 IDENTIFICATION OF MATERIALS

A. Before nameplates and markers are applied, the equipment and piping shall be cleaned and painted.

B. Name plate shall be made of black surface, white core laminated Bakelite with 1" high indented letters. Nameplates shall be minimum 5" long by 3" wide and bear the equipment name as designated in the specifications. Nameplates shall be as fabricated by Seton Nameplate Co., Atlantic Engraving Co., W.H. Brady Co., or approved equal. Attach with screws or rivets only.

C. A legend showing the service and an arrow indicating the direction of flow shall be applied on each pipe installed by the Plumbing Subcontractor

D. The piping of each system shall be identified in the following locations and where directed by the Architect.

1. Pipe mains and branches – every 10'-0"

2. At each valve.

3. Each wall penetration (both sides)

4. Each riser including branch risers from mains.

5. At each piece of equipment.

6. At each change of direction

7. Near each access panel.

E. Gray Water (water reuse systems)

1. The entirety of the piping system shall be painted purple

2. Shall be labeled "Caution Gray Water System" every 10'-0" (maximum spacing)

F. Non-metallic piping used for gas fired equipment flues or combustion air intake shall be labelled as follows:

1. Exposed piping
    a. Every 10′-0″ maximum spacing
    b. At each piece of equipment
    c. At each change of direction
    d. Each wall penetration (both sides)
2. Concealed piping
    a. Every 3′-0″ maximum spacing
    b. At each piece of equipment
    c. At each change of direction
    d. Each wall penetration (both sides)
3. Lettering:
    a. Shall be black lettering on white background and indicate that the piping is used for.
    b. Letters shall be 2″ tall for piping 2″ and larger.
    c. Letter height on piping smaller than 2″ shall matching the nominal pipe diameter.

G. The identification of piping shall be coordinated with the Owner and comply with OSHA and ANSI A13.1 Standards for the identification of systems. Obtain approval of Architect prior to installation. The letter size and background color shall conform to the ANSI Scheme for the Identification of Piping Systems.

Outside Pipe Diameter (inches)	**Letter Height (inches)**
¾″ to 1 ¼″	½″
1 ½″ to 2″	¾″
2 ½″ to 6″	1 ¼″
8″ to 10″	2 ½″

Over 10”	3 ½”

H. Provide all labels on all capped piping.

I. The pipe markers shall be installed on the apparatus in full view and shall be a color that is in sharp contrast with the background. Color coding to be in accordance with the standards outlined in ANSI.

J. Piping systems shall be identified with approved snap-on covers designating services and direction of flow. Location of identification covers shall be near access panels wherever possible on both sides of valves. The markers shall be as manufactured by Marking Services, Inc.(MSI), W.H. Brady Company, Westline Products, Seton Nameplate Company or approved equal.

K. All piping within return air plenums and exposed to the elements (outside a building) shall be labeled via painted on stenciled lettering and flow arrows. Color and letter size shall match those of the snap-on covers specified herein. See division 9 for material and application requirements.

L. Piping installed across a roof surface shall be identified with 36” long marker flags attached to the rooftop piping supports so the piping location can be identified after being covered with snow.

3.15 STORM PIPING

A. Pipes shall be plumb and parallel to building walls, beams, and columns. All horizontal lines are to be evenly pitched and properly secured with iron or steel hangers. A pitch of ¼” per lineal foot shall be maintained on all soil, waste, and conductor lines, wherever possible.

B. Where long runs of piping require less pitch due to space restrictions, a less pitch shall be allowed on main lines 4" and over in size, but in no event should any pipeline have a slope less than 1/8" per lineal foot.

C. Carefully layout the work in advance so that the pipes will pass through the opening and permit the proper pitch to the pipelines. Due to the extensive system of ventilation and lighting systems, it will be necessary for all trades to properly coordinate their work with the work of other trades so as to avoid the necessity of taking down work installed without prior checking.

3.16 CLEANOUTS

A. Provide and connect cleanouts with brass caps and screws same size as pipe up to 4" and not less than 4" for larger piping at the ends of all storm piping. Cleanouts shall be provided at the base of all stacks and at all changes of direction in the drainage piping system per code. Cleanouts shall be no more than 50′ apart on piping 4″ and smaller and no more than 100′ apart on piping larger than 4″.

B. Cleanouts shall be installed and spaced in the piping systems per code. Cleanout shall be installed at all changes of direction greater than 45 degrees and at all changes in direction where the total sum of fittings to make the change in direction is greater than 45 degrees.

C. Where stacks enter drains near walls or piers causing difficult access to end cleanouts, there shall be a vertical cleanout on the stack just above the floor with a 1/4 bend at the foot of the stack.

D. A building cleanout shall be provided inside the building footprint at the foundation wall where all drainage system piping exists, one cleanout per system.

E. Where such conditions occur in walls or partitions, the cleanout cover shall be accessible through an opening left in the wall and covered with the flush chromium plated brass plate or access panel securely fastened in place.

F. Dual direction cleanouts shall be installed before and after all backwater valves where backwater valves are installed.

G. Cleanout shall be provided on wet wall horizontal runs and on batteries of plumbing fixtures. Said cleanouts shall be piped up to an elevation 6″ above the flood rim of the fixture, with access provided.

3.17 PLUMBING SYSTEMS ACCEPTANCE PROCEDURE

A. Performance Testing

1. The Plumbing Subcontractor shall coordinate with other subcontractors, and work together to demonstrate each system completely to the Owner, proving that all systems work installed and comply with the design concept, shop drawing and sequence of control. The subcontractor shall submit, by system, a performance test method and format that indicates the system, the point descriptors for all systems, field values, BAS values, occurrence values, manual automatic controls, status values, etc., for

approval.

2. The subcontractor shall assist and demonstrate, by witness tests, education programs, inspection, the functioning of the plumbing systems as part of the complete Building Acceptance Procedure. Refer of General Conditions for additional requirements.

3. A separate binder shall be maintained by the subcontractor containing, by system, all punch list items, performance test format and trend logs relative to testing.

4. The subcontractor shall notify the Owner in writing that each system is complete and ready for testing. If it is found that the systems are incomplete, the Plumbing Subcontractor shall reimburse the Owner for additional time, expenses and material required to complete testing of each system.

5. Upon completion of the performance test of each system, the Owner, in writing, shall submit his recommendation regarding acceptance so that beneficial use may be determined.

B. Owner's Acceptance of Test Procedure

1. Submittal data relevant to Performance Characteristics, functions, limits, sequences, interlocks, power fail-restart, and associated parameters and other pertinent information for the operation system and database shall be forwarded from the Plumbing Subcontractor to the Owner's authorized representative and Engineer's representative.

2. Any deficiency identified during demonstration shall be noted as a punch list item, but progress of demonstration shall not be halted to correct the deficiencies.

3. Problems which occur within approved hardware or software shall be corrected in an appropriate fashion under guarantee. Any such occurrence shall not void previous approval; however, the Plumbing Subcontractor shall be responsible to attend and to remedy such items within reasonable amount of time. Appropriate logs, schedules and reports shall be maintained to reflect these items and their redress.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for plumbing work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

- END OF SECTION –

SECTION 310000

EARTHWORK

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Work under this Section includes all labor, materials, and equipment necessary to perform all earthwork operations for the Work indicated on Contract Drawings and as specified herein.

B. Section includes:

1. QA/QC procedures and associated submittals
2. Excavating, backfilling, and compacting for drainage piping and structures.
3. Gravel base for HMA, sidewalk, curbing, and drainage structures.
4. Engaging an independent, qualified Geotechnical Testing Agency to perform required QA/QC inspection and testing.
5. Disposal of soils.

1.03 RELATED WORK

A. Other specification sections that directly relate to the work of this Section include, but are not limited to, the following:

1. Section 015713 – Temporary Erosion and Sedimentation Control.
2. Section 021000 – Site Preparation.

1.04 REFERENCE STANDARDS

A. Follow the guidelines contained in the latest editions of the following codes, specifications, and standards, including references contained in each document, except where more-stringent requirements are shown or specified.

1. Connecticut Department of Transportation (CTDOT):

    a. 2016 Standard Specifications for Roads, Bridges, Facilities. and Incidental Construction and all supplements.

2. ASTM International:

    a. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

    b. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

    c. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes

    d. ASTM D6913 – Standard Test Methods for Particle Size Distribution (Gradation) of Soils Using Sieve Analysis.

    e. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.05 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subgrade and hot-mix asphalt paving.

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

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

E. Compaction: The tamping and rolling of all backfill placed in uniform horizontal layers not exceeding a defined uncompacted lift thickness.

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

G. Gravel Base: Well-graded coarse aggregate used to provide a base for proposed structures, or an unbound base material for HMA pavement.

H. Imported Soil: Soil material imported from off site used as suitable backfill.

I. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

J. Licensed Site Professional (LSP): The responsible party for overseeing the environmental testing and associated soils management operations on behalf of the Prime Contractor.

K. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu yd for bulk excavation or 3/4 cu yd for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

L. Structures: Buildings, footings, foundations, retaining walls, slabs, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

M. Subgrade/In Situ Soil: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

N. Suitable Fill: Soil material meeting the requirements defined herein and used for general backfill. Suitable fill shall be used as backfill around all drainage structures.

O. Topsoil: Upper course placed on areas of proposed plantings and grassed areas. Refer to landscape drawings for additional information.

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

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

1.06 PRECONSTRUCTION MEETINGS

A. Preconstruction Conference: Conduct preconstruction conference at the Project site fourteen days prior to the start of work.

1. At a minimum, the preconstruction conference shall be attended by:

a. Contractor.

b. Simpson Gumpertz & Heger (SGH), Engineer of Record (EOR).

2. Review methods and procedures related to earthwork, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.

b. Coordination of Work with utility locator service.

c. Coordination of Work and equipment movement

d. Field quality control.

1.07 SUBMITTALS

A. General

1. All submissions shall be in accordance with the submission schedule, which shall be developed and agreed between the Contractor and the EOR at the commencement of the project.

B. Preconstruction: The contractor shall submit to the EOR the following prior to commencement of work:

1. Submit the following action submittals for review and approval:

a. Sourcing of Backfill materials: Information defining the proposed source(s) of off-site imported Backfill material(s).

b. Material Test Reports: From Contractor-retained qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

(1) Classification according to ASTM D2487 of each on site and borrow soil material proposed for Backfill.

(2) Laboratory compaction curve according to ASTM D698 for: each on site and borrow soil material proposed for Backfill, and on site soil at subgrade for HMA pavement, including statement of optimal moisture content.

(3) Grain size analysis according to ASTM D6913 for suitable backfill, and stockpiles of suitable onsite materials proposed for reuse.

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

d. Earthwork Management Plan: Earthwork management plan shall include, at a minimum, stockpiling locations, loading and processing areas, air quality and dust control, waste management, and general sequencing for major earth moving operations.

e. Earth Support System Design: Contractor shall submit an earth support system design sealed by a professional engineering in the state of Connecticut the EOR for review and approval. The design shall include including, at a minimum, calculations, design drawings, and shop drawings.

C. Field Quality Control: Submit the following informational submittals as specified or per request of the EOR during construction. Keep records throughout construction for all of the following:

1. Inspection and Testing for Backfilling, and other Work, unless otherwise noted:

a. Testing Agency: Contractor will engage an independent, qualified Geotechnical Testing Agency to perform tests and inspections as follows:

(1) Inspect and test each backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

(2) Perform field compaction tests of soils in place according to ASTM D1556 and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

(a) Typical Open Trench: At each compacted initial and final backfill layer, at least one test for every 100 ft or less of trench length but no fewer than two tests for each length of trench being compacted at one time.

(b) Contractor is to provide laboratory compaction curve according to ASTM D698 and statement of optimum moisture content of representative samples of each Backfill material from stockpile to EOR prior to trench

backfilling. Provide additional compaction test data of stockpiled backfill materials as directed by the EOR.

2. The contractor is responsible for all characterization testing required for soils handling and/or designated for disposal and coordination of acceptance at disposal facility including any documentation or subsequent testing required by the disposal facility.

D. CLOSEOUT

1. Provide the following record documents:

a. All records from Field Quality Control program.

b. As-built survey plan: The plan shall include topography shown in 1 ft contour intervals for all areas within the Limit of Work (LOW). Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions encountered during the construction of proposed work. The as-built survey plan shall be prepared by a registered land surveyor in the State of Connecticut.

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

1. Warning tapes.

1.08 PROJECT CONDITIONS

A. Contractor shall make their own assessment of existing conditions including adjacent property and the possible effects of their proposed temporary works and construction methods, and shall develop methods and phasing which will assure safety to the public, adjacent property, and the completed Work.

B. The contractor shall protect existing utilities, structures, and site improvements adjacent to earthwork operations from damage. All construction-induced damage attributable to earth moving activities shall be repaired by the Contractor. Prior to the start of any construction activity, the Contractor and the EOR shall jointly inspect the site to observe and document the preconstruction condition of the site, existing structures and facilities.

C. 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.

D. Contractor to coordinate all work adjacent to the property line with abutters. Contractor shall restore any temporarily disturbed areas adjacent to the property line to preconstruction conditions, or to the satisfaction of the abutting property owner if the work results in temporary disturbance on their property.

E. Utility Locator Service: Notify Dig Safe for area where Project is located before beginning earth moving operations.

1.09 QUALITY ASSURANCE

A. Do not commence site clearing construction operations until temporary erosion and sedimentation control measures are in place.

B. The Engineer's duties do not include the supervision or direction of the actual work by the Contractor, their employees or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the Contractor from defects discovered in their Work at that time or subsequent to the testing.

1.10 REGULATORY REQUIREMENTS

A. The Contractor shall comply with all excavation, trenching, and related sheeting and bracing requirements of Occupational Safety and Health Administration (OSHA) excavation safety standards, 29 CFR, Subpart P, Part 1926.650 through 1926.652.

B. The Work of this Section shall be performed in accordance with all applicable Federal, State, and local regulations, laws, codes, and ordinances governing the handling, transportation and disposal of on-site soils. The Contractor shall notify the EOR of any contaminated materials encountered during excavation work. All handling, transportation, and disposal of such materials shall be accomplished in accordance with applicable Connecticut Solid and Hazardous Waste Regulations.

1.11 PROTECTION OF WORKERS

A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926. Contractors shall be familiar with the requirements of these regulations.

B. The Contractor is responsible for the adequacy of any excavation support systems and shall retain the services of a Professional Engineer registered in Connecticut to design the required excavation support systems. The Contractor's Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support systems and shall design in

conformance with OSHA requirements. The Contractor's Professional Engineer shall provide sufficient on-site inspection and supervision to assure that any excavation support systems are installed and function in accordance with their design. Criteria listed herein defining the responsibilities of the Contractor's Professional Engineer are minimum requirements. Refer to Contract Drawings for minimum submittal requirements for support of excavation design.

PART 2 – MATERIALS

2.01 SOIL MATERIALS

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

B. Sampling and testing of material at source shall not preclude future rejection if it is subsequently determined to lack uniformity or it fails to conform to specified requirements, or otherwise judged unsuitable by the Civil/Geotechnical EOR, or inspecting and testing agency.

C. Suitable Fill: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or a combination of these groups; free of rock or gravel larger than 3 in. in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

D. Retained fill: Meeting the requirements of suitable fill and requirements indicated on the drawings.

1. Contractor to utilize stockpile area on site as indicated on the drawings for retained fill. If stockpile area is insufficient, contractor shall import retained fill.

E. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Satisfactory materials that do not meet the gradation requirements for the intended use.

2. Soils that contain organic matter, garbage, metal, debris, clay, or other deleterious material.

3. Unsatisfactory soils also include Suitable Fill not maintained within 2% of optimum moisture content, as determined by a qualified testing agency, at time of compaction, and those that include rock or gravel larger than 3 in. in any dimension, debris, waste, frozen materials, vegetation, and other deleterious material.

F. Gravel Base: shall consist of broken or crushed stone, gravel, reclaimed miscellaneous aggregate or a mixture thereof meeting CTDOT material specification M.02.01.

G. Crushed Stone: shall conform to the requirements of Article M.01, No. 6 Gradation as per CTDOT form 817 and Subarticle M.02.02.2 (a), CTDOT form 817, for loss on abrasion.

2.02 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 in. wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.

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

3. Orange: Telephone and other communications.

4. Blue: Water systems.

5. Green: Sewer systems.

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

1. Red: Electric.

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

3. Orange: Telephone and other communications.

4. Blue: Water systems.

5. Green: Sewer systems.

PART 3 – EXECUTION

3.01 PREPARATION

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

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

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

3.02 DEWATERING

A. Prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered.

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

2. Remove rock to lines and grades indicated to permit installation of permanent construction.

B. Contractor is responsible for field locating all existing utilities with proposed areas of excavation prior to construction and for taking precautions to not damage existing utilities as part of the proposed work. Any excavation around gas mains or gas services shall be done by hand excavation following the State of Connecticut

regulations. Mechanical equipment can only be used to remove any surface pavement above the gas main or gas service.

C. Stop work in the vicinity of suspected contaminated soil. Immediately notify EOR so that appropriate testing and subsequent action can be taken. Resume work in the immediate vicinity only upon direction by EOR.

3.05 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 in. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing utilities and other construction, and for inspections.

1. Excavations for leveling pad: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Excavation for Underground Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 in. Do not disturb bottom of excavations intended as bearing surfaces.

3.06 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to the gradients, lines, depths, and elevations indicated on the Contract Drawings.

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

1. Clearance: As indicated on drawings.

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

1. For pipes and conduit less than 6 in. in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.

2. For pipes and conduit 6 in. or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.

3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.

4. Excavate trenches 12 in. deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

5. Excavate trenches 12 in. (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. The side slopes of the excavation shall be shored/shielded or cut back in accordance with OSHA regulations.

E. Excavation of trenches is to be in accordance with Regulations of Connecticut State Agencies, Section 16-345-1 to 16-345-9:

F. Contractor is to obtain any required trench or excavation permits as applicable.

G. When the walls of the excavation are cut back, the excavated material shall be piled so that the slope of the stockpile above the excavation is at an angle of not more than 45° from the horizontal. The toe of the stockpile shall be kept a distance of at least one-half the depth of the excavation from the crest of the excavation to prevent material from rolling, sliding, or falling into the excavation.

H. Excavations, and excavation preparation and protection shall be carried out in accordance with OSHA regulations and requirements.

I. Excavated materials not suitable to be reused shall be disposed of as directed by the Owner, and local, state, and federal regulations.

3.07 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade pavement.

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

C. Perform compaction testing of subgrade prior to proceeding.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, construction activities, or not meeting the required compaction levels, as directed by Engineer.

3.08 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavations under miscellaneous construction, pipe, or conduit as directed by EOR.

3.09 SETTLEMENT OR MOVEMENT OF EXISTING UTILITIES AND EARTH SUPPORT SYSTEM

1. Contractor shall submit proposed monitoring program to EOR for approval prior to construction, including locations of monitoring points and other instrumentation (if applicable).

2. The contractor shall maintain records with all monitoring data. All data collected shall be available to the EOR within 24 hours. Data shall be compared to threshold and limiting values.

3. The threshold level for utility and support of excavation monitoring points shall be 0.25 in., with a limit level of 0.5 in.

    a. If the threshold level is reached on any monitoring point, immediately notify the Owner and EOR, and increase the frequency of movement monitoring as required. Review and modify work operations and procedures as needed to minimize additional movements and prevent reaching the limit level. All modifications to the work must be agreed upon with the EOR prior to implementation.

    b. If the limit level is reached, immediately halt work activities except those needed to prevent instability from occurring, and notify the Owner and EOR. Review and modify work operations and procedures, and structure/utility support requirements as needed. Mitigation and repair action plans shall be submitted for approval.

4. Provide suitable settlement or movement monitoring systems throughout construction. Monitor adjacent existing utilities and structures for vertical or horizontal movement.

5. In case of settlement or other movement which might cause damage, take immediate remedial measures to correct the conditions and damages caused by the settlement.

3.10 STORAGE OF SOIL MATERIALS

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

1. Stockpile soil materials away from edge of excavations.

2. Maintain erosion controls in working order around stockpiled materials.

3.11 BACKFILL

A. General

1. Contractor operations shall be suspended whenever weather conditions are unsatisfactory for placing backfill.

2. After occurrence of precipitation, do not operate equipment on previously placed material or an approved excavation until material has dried sufficiently.

3. When excavations or previously placed material have been softened or eroded, all soft and yielding material or other unsuitable or damaged areas shall be removed and replaced with compacted backfill as specified.

B. 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. Testing and inspecting underground utilities.

4. Removing concrete formwork.

5. Removing trash and debris.

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

3.12 TRENCH BACKFILL

A. General

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

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

a. Surveying locations of underground utilities for as-built survey and Record Documents.

b. Removing concrete formwork, where used.

c. Removing trash and debris.

d. Removing temporary earth support systems (if applicable).

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. Backfill voids with suitable fill while removing shoring and bracing.

D. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of suitable fill, free of particles larger than 1 in. in any dimension, to a height of 12 in. over the pipe or conduit.

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

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of suitable fill to final subgrade elevation.

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

3.13 SOIL FILL

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

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

1. Under grass and planted areas, use satisfactory soil material.

2. Under pavements, use satisfactory soil material.

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

3.14 SOIL MOISTURE CONTROL

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

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2% and is too wet to compact to specified dry unit weight.

3. When moisture content is excessive, defer compaction until the material has dried to suitable moisture content. Natural drying may be accelerated by manipulation to increase the rate of evaporation, or by blending similar materials from a dry stockpile. If drying is accomplished by blending in a dry material, take care not to exceed the specified maximum layer thickness for compaction. Remove any excess material from the layer before compaction.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Compaction equipment shall be suitable for the material and lift thickness, and operated in accordance with the manufacturer's instruction for effective compaction.

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

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

D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under pavements, excavate, replace and re-compact top 24 in. of existing subgrade and each layer of backfill or fill soil material at 95%.

2. Under turf or unpaved areas, scarify and recompact top 6 in. below subgrade and compact each layer of backfill or fill soil material at 90%.

3. For utility trenches, compact each layer of initial and final backfill soil material at 90%.

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

3.16 GRADING

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

1. Provide a smooth transition between adjacent existing grades and new grades where applicable.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

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

1. Pavements: Plus or minus 1/2 in.

3.17 BASE COURSES UNDER PAVEMENTS OR PAVERS

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

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

1. Place base course material over subbase course under hot-mix asphalt pavement.

2. Shape base course to required crown elevations and cross-slope grades.

3. Place base course 6 in. or less in compacted thickness in a single layer.

4. Place base course that exceeds 6 in. in compacted thickness in layers of equal thickness, with no compacted layer more than 6 in. thick or less than 3 in. thick.

5. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95% of maximum dry unit weight according to ASTM D698.

3.18 FIELD QUALITY CONTROL

A. Special Inspections: Contractor will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.

2. Determine that fill material classification and maximum lift thickness comply with requirements.

3. Determine, during placement and compaction that in-place density of compacted fill complies with requirements.

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

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

D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Trench Backfill: At subgrade and at each compacted initial and final backfill layer, at least one test for every 150 ft or less of trench length, but no fewer than two tests per pipe segment.

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 materials to depth required; recompact and retest until specified compaction is obtained.

3.19 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 recompact.

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

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

3.20 DISPOSAL OF SURPLUS SOILS AND WASTE MATERIALS

A. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off property.

B. Disposal of all demolished material shall be off site by the contractor and in accordance with all federal, state, and local requirements. No on-site burial pits are allowed.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 321200

FLEXIBLE PAVING

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Work Included: This Section specifies the construction of bituminous concrete pavement on gravel base course, to the lines, grades, compacted thickness, and cross sections indicated. Work includes pavement for site and trench repairs i

1.03 QUALITY ASSURANCE

A. The Authority reserves the right to perform inspections and testing at the plant and in the field at any time during the execution of work.

1.04 QUALITY CONTROL

A. The contractor shall engage the services of a qualified independent testing agency approved by the Authority to perform quality-control testing in the field.

B. Job Mix Formulae

1. The composition limits specified in CT DOT Section M.04 are master ranges of tolerances of materials in general. In order to obtain standard texture, density, and stability, furnish to the Engineer for approval a specific job mix formula for the particular uniform combination of materials and sources of supply to be used on each project. Establish the job mix formula in accordance with the requirements of the Connecticut DOT standards.

2. Should a change of sources of materials be made, furnish a new job mix formula for approval before using the new material.

3. Two or more job mix formulae may be approved for a particular plant; however, only material conforming to one job mix formula will be permitted to be used on any given day. If the Contractor elects to furnish bituminous

concrete from more than one plant, the job mix formulae shall be adhered to by all plants.

4. When unsatisfactory results or other conditions make it necessary, the Engineer may establish a new job mix formulae.

C. Methods of Sampling and Testing

1. Performance Graded Asphalt Binder

a. Viscosity: ASTM D4402.

b. Dynamic Shear: AASHTO 315

c. Flash Point: AASHTO T48.

d. Rolling Thin Film Over Test: AASHTO T240.

e. Mass Change Percentage: AASHTO T240.

f. PAV Aging: AASHTO R28

g. Specific Gravity: ASTM D70/D70M-21

h. Creep Stiffness and M-Value: AASHTO T313

2. Cutback Asphalt

a. Viscosity: ASTM D2170.

b. Flash Point: ASTM D3143.

c. Distillation: ASTM D402.

d. Water in Asphalt: AASHTO T55.

e. Specific Gravity: AASHTO T228.

3. Emulsified Asphalt: ASTM D977.

4. Mineral Aggregates and Filler:

a. Sieve Analysis, Aggregates: ASTM C136.

b. Sieve Analysis, Mineral Filler: ASTM D242.

c. Unit Weight of Aggregate: ASTM C29.

d. Material Passing No. 200 Sieve: ASTM C117.

e. Abrasion of Coarse Aggregate: ASTM C131.

f. Soundness of Aggregates: ASTM C88.

g. Specific Gravity, Coarse Aggregate: ASTM C127.

h. Specific Gravity, Fine Aggregate: ASTM C128.

i. Specific Gravity, Mineral Filler: AASHTO T100 to T133

5. Bituminous Concrete Mixtures:

a. Density: AASHTO T166.

b. Compaction: ASTM D2950.

D. Composition, Thickness, and Compaction Acceptance Tests:

1. Where plant inspection is maintained, bituminous concrete will be acceptable for use if the specified tests from samples obtained at the production plant indicate conformance to the approved job mix formula.

2. Thickness: In-place compacted thickness of HMA courses will be determined according to ASTM D3549. One core sample will be taken for every 1,000 sq yd or less of installed pavement, with no fewer than seven total cores taken. The Authority may also require additional cores. The procedures for selecting locations for sampling are described in ASTM D3665. Testing agency shall take samples of compacted pavement according to ASTM D5361. Replace and compact HMA where core tests were taken using HMA paving.

3. In-Place Density: Testing agency shall take samples of uncompacted paving mixtures according to ASTM D979, and compacted pavement according to ASTM D5361.

a. 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 D2041.

b. In-place density of compacted pavement will be determined by testing core samples according to ASTM D1188 or ASTM D2726.

(1) Cores extracted for thickness testing may be used for maximum theoretical density and in-place compacted density testing, subject to the approval of the Engineer and Authority.

(2) Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D2950 and correlated with ASTM D1188 or ASTM D2726.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Performance Graded Asphalt Binder: as per CT DOT Section M.04.

B. Cutback Asphalts:

1. Medium-Curing: AASHTO M82, grade as indicated.

C. Bituminous Emulsions:

1. Asphaltic Emulsions: AASHTO M140, grade as indicated. Use grade RS-1 for tack coat.

2. Cationic Emulsified Asphalt: AASHTO M208, grade as indicated.

3. Clay-Type Asphalt Emulsion: A mineral colloid type of asphalt emulsion containing no chemical emulsifiers and meeting the following requirements:

a. Percent water, per AASHTO T59: 40 to 55.

b. Percent residue by evaporation, per AASHTO T59: 45 to 60.

c. Percent ash in residue, per ASTM D8078: 5 to 15.

d. Curing time, per CTDOT standard test procedures: firm set in 48 hrs maximum.

e. Resistance to water, per CTDOT standard test procedures: No re-emulsification.

4. Protective Seal Coat Emulsion: a homogeneous emulsion consisting of coat tar pitch dispersed in water by means of a mineral colloid, containing no asphaltic materials or chemical emulsifiers; capable of overcoming any separation or coagulation of its components by moderate stirring; meeting the following requirements:

a. Percent Water, per AASHTO T59: 50 maximum.

b. Percent non-volatile matter, per ASTM D2939: 48 minimum.

c. Percent ash in non-volatile matter, per ASTM D2939: 20 to 45.

d. Percent solubility on non-volatile matter in carbon disulfide: 40 minimum.

e. Resistance to water, per ASTM D466: no blistering, loss of adhesion, or re-emulsification.

f. Resistance to petroleum solvents, per ASTM D466 with solvents substituted for water: no penetration nor loss of adhesion.

D. Asphalt Anti-Stripping Additive:

1. General: An additive to asphalt to assist in the coating of wet aggregate and to increase the resistance of the bituminous coating to stripping in the presence of water; shall be chemically inert to asphalt (heat stable) and when blended with asphalt shall withstand storage at a temperature of 400°F for extended periods without loss of effectiveness.

2. Composition: An organic chemical compound free from inorganic mineral salts or inorganic mineral soaps, containing no ingredient harmful to the bituminous material or to the operator, and not appreciably altering the specified characteristics of the bituminous material; chemically inert to asphalt.

3. Heat Stability: The compound shall retain its effectiveness after heating in asphalt according to the prescribed method for 24 hrs at 350°F.

4. Resistance to Stripping. Treated Bitumen shall coat wet aggregate and shall retain at least 90 percent of the coating after 24 hrs of static immersion. There shall be no loss of the retained coating after the immersion has been extended to one week.

E. Coarse Aggregate:

1. General: Clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock, free from a detrimental quantity of thin or elongated pieces, and free from dirt or other objectionable materials; having a percentage of wear of not more than 30; surface dry and having a moisture content of not more than 0.5 percent after drying. The use of crushed gravel stone will not be permitted.

2. Gradation: Blended from the stone sizes listed in CT DOT M.05. Each stone size shall meet its respective gradation as in CT DOT M.05. Sizes other than primary stone sizes may be used providing they are separately introduced on

the cold feed belt and can be shown to be an improvement to the mix. Such usage shall require the prior written approval of the Engineer.

F. Fine Aggregate:

1. General: Natural or stone sand or a blend thereof; or a blend of natural sand and stone screenings, or a blend of stone, sand and stone screenings:

a. Natural Sand: Clean, inert, hard durable grains of quartz or other hard durable rock, free of loam, clay, surface coatings or other deleterious substances.

b. Stone Sand: Process from the stone screenings of either a primary or secondary crusher to produce a product that when used alone or blended in any combination with natural sand shall meet the specified gradation requirements. Wash plant or other equipment used for processing stone sand shall be as accepted by the Engineer.

G. Mineral Filler: Portland cement, limestone dust, hydrated lime, stone float, or stone dust, 100% passing a No. 50 sieve and not less than 65% passing a No. 200 sieve. Stone dust shall be produced from crushed ledge stone and shall be the product of a secondary crusher so processed as to deliver a product of uniform grading.

H. Reclaimed Asphalt Pavement (RAP): Reclaimed Asphalt Pavement (RAP) shall consist of the material obtained from the highways or streets by crushing, milling, or planing existing hot mix asphalt pavements. This material shall be transported to the hot mix asphalt production facility yard and processed through an appropriate crusher so that the resulting material will contain no particles larger than the maximum aggregate size of the hot mix asphalt mixture in which it will be used. The material shall be stockpiled on a free draining base and kept separate from virgin aggregates. The material contained in the RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall be protected from accumulation of excessive moisture and shall not be contaminated by foreign materials. The use of RAP will be permitted provided that the end product is in conformance with the approved job-mix formula as per CT DOT M.04. The proportion of RAP to virgin aggregate for base course mixtures and intermediate course mixtures shall be limited to a maximum of 40% for drum mix plants and 20% for modified batch plants. The maximum amount of RAP for surface course mixtures shall be 10%.

2.02 SUPERPAVE BITUMINOUS CONCRETE MIXES

A. Provide HMA S0.5 bituminous concrete mixtures for surface course composed of mineral aggregate, mineral filler if required bituminous material, and anti-stripping additive if required, proportioned as specified herein to conform to the composition by weight tabulated in CT DOT Section M.04 and in the approved job-mix formulae.

B. Provide HMA S1.0 bituminous concrete mixtures for base course composed of mineral aggregate, mineral filler if required bituminous material, and anti-stripping additive if required, proportioned as specified herein to conform to the composition by weight tabulated in CT DOT Section M.04 and in the approved job-mix formulae.

C. Use sufficient mineral filler to correct any deficiencies in grading of fine aggregate.

D. Anti-stripping additive, if required, shall be incorporated and thoroughly dispersed in the bituminous material in an amount equal to the percent by weight established by the Authority's Materials Testing Laboratory. This percent will be based on the efficiency of the additive as determined by laboratory tests. No modification of the established additive concentration will be permitted because of the use of hydrophobic aggregate. The Authority reserves the right to establish as minimum the percentage of additive required. Blend additive in the refinery with the asphalt in the presence of the Inspector.

PART 3 – EXECUTION

3.01 PLANT REQUIREMENTS

A. General: The plant used in the production of bituminous concrete shall comply with AASHTO M156, subject to the following additional requirements.

B. Plant Scales

1. Scales for measuring materials into the mixtures shall be springless dial type and shall be of standard make and design. Scale graduations and markings shall be plainly visible, and dials shall be so located as to be easily readable from the operator's normal work station by direct sight or through repeating dials. Parallax effects shall be reduced to the practical minimum with clearance between indicator index and scale graduations not exceeding 0.06 in. Dials shall be equipped with a full complement of adjustable index pointers for marking the required weight of each material to be weighed into the batch.

2. Digital scales will be either electric/mechanical (load cell and lever system) or fully electronic (all load cell). Digital indicators shall be of standard make and design. Scale graduations and capacity shall be plainly visible on the faceplate of the indicator, if panel mounted. If the unit is of desktop or wall-mount variety, a data sticker shall be located on the side of the unit. Indicators must be located as to be easily readable from the operator’s normal workstation by sight.

3. Bitumen scales shall be accurate to 0.05%, have minimum graduations not greater than 0.025%, and shall be readable and sensitive to 0.0125% or less. Scales for any weigh box or hopper shall be accurate to 0.5%, have minimum graduations not greater than 0.5% and shall be readable and sensitive to 0.25% or less. The preceding percentages for both bitumen and aggregate scales are based on the maximum total batch weight of the mixtures.

C. Testing of Scales:

1. All plant scales, including truck scales, shall be tested at the expense of the Contractor by a competent scale technician as follows:

a. Annually prior to use in Authority work.

b. At intervals of not more than ninety calendar days.

c. At any time ordered by the Engineer.

2. A cradle or platform approved by the Engineer for each scale and at least ten standard fifty-pound test weights shall be provided for testing scales whenever directed by the Engineer. The use of a set of test weights for two or more plants will be permitted only when they can be made readily available with no more than an hour's notice.

3.02 AUTOMATED BATCHING

1. Automatic proportioning. Batch type mixing plants shall be equipped with approved automatic proportioning devices. Such devices shall include equipment for accurately proportioning batches containing the various components of the mixture by weight in the proper sequence and for controlling the sequence and timing of mixing operations. Interlocks shall be provided which will hold or delay the automatic batch cycling whenever the batched quantity of any component is not within the specified weight tolerance, when any aggregate bin becomes empty or when there is a malfunction in any portion of the control system. The weight setting and time controls shall be so equipped that they may be locked when directed by the Engineer.

2. Automatic Recordation. Recordation equipment shall be provided. Each recorder shall include an automatic printer system. The printer shall be so positioned that the scale dial and the printer can be readily observed at one location by the plant inspector. Use of repeating dials or an additional printer to achieve this condition will be permitted. The printer shall print, in digital form, on a delivery ticket the following data:

a. Date mixed.

b. Time of batching.

c. Tare weight of aggregate weigh box.

d. Tare weight of bitumen weigh bucket.

e. Accumulative weights as batched for each bin. (Total of last bin will be aggregate total).

f. Weight of bitumen.

g. Total weight of mix in truck (Pay weight). This printed ticket shall be used in lieu of truck scale weights.

3. Equipment Failure. If at any time the automatic proportioning of recording system becomes inoperative, the plant will be allowed to batch materials manually for a period not in excess of two working days. Manual batching for longer periods will require written permission from the Engineer.

4. Batching Controls:

a. The batching controls shall meet the following delivery tolerances with respect to the various components weighed in each batch:

(1) Tare Weight of Aggregate Weigh Box: + 0.5% of total batch weight.

(2) Tare Weight of Bitumen Weigh Bucket: + 0.1% of total batch weight.

(3) Individual Aggregate Components: + 1.0% of total batch weight.

(4) Combined Aggregate Components: + 1.5% of total batch weight.

(5) Mineral Filler: + 0.5% of total batch weight.

(6) Asphalt: + 0.1% of total batch weight.

b. The total weight of the batch shall not vary more than ±2 % from the theoretical design weight.

c. If directed by the Engineer, provisions shall be made for locking controls against tampering.

B. Plant Laboratory:

1. A building shall be furnished at the site of the producing plant suitable for the housing and use of equipment necessary to carry on the various tests required and for recording and processing test results. This building shall be for the exclusive use of the Engineer or his representatives for testing and recording purposes.

2. The building shall have a minimum floor area of 100 sq ft; the least dimension to be 6 ft. Windows and doors shall be adequately screened; satisfactory lighting, heating and water shall be supplied. A table, chairs, desk and work bench shall be provided. Provision shall be made for the safe performance of extraction test determinations by providing an adequate exhaust fan and suitable means of disposing of used solvent and other waste.

3. If the Engineer permits, the plant laboratory may be part of another building in which case it shall be entirely partitioned off from the remainder of such building.

4. Testing equipment shall be furnished as follows and installed in the building for use in testing the materials and mixtures supplied by the Plant for the work:

   a. One Approved Rotary Extractor.

   b. One Coarse Aggregate Sieve Shaker, power driven with a minimum clear siege area of 324 square inches. The shaker shall be attached to a firm anchorage.

   c. One each of the following square opening screens for coarse aggregate shaker: 2 in., 1-1/2 in., 1 in., 3/4 in., 1/2 in., 1/8 in., No. 4 and No. 8.

   d. One Fine Aggregate Sieve Shaker, power driven and independent of the coarse aggregate shaker, for 8 in. minimum diameter sieves.

   e. One each of the following standard 8 in. minimum diameter square opening sieves: 3/4 in., 1/2 in., 3/8 in., No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, and No. 200, with pan and cover.

   f. One Sample Splitter with a minimum capacity of 1 cu ft. It shall be the clam shell type, and the chute width shall be adjustable from a minimum of 1/2 in. up to 2 in.

g. One Solution Balance, 20 kilogram capacity, weighing directly to 1 gram, with two weighing beams and a taring beam; tare capacity to be 2 kilograms; weighing beams to read 1000 grams by 100 gram divisions and 100 grams by 1 gram division. Additional matching weights (one 1 kg., two 2 kg., one 5 kg., and 10 kg.) shall be provided to fulfill the capacity of 20 kilograms. The platform to be 11 in. in diameter.

h. One Approved Scale with a minimum capacity of 2,000 grams and with a sensitivity of 0.50 grams.

i. Two Approved Dial Type Thermometers, range 50°F. to 500°F.

j. One Approved Hot Plate.

5. Approval of a plant will be contingent upon approval of the aforementioned requirements for Plant Laboratory, including the building and appurtenances, furnishings, facilities including heat, light, power and water, the testing equipment, and any other incidentals.

C. Sampling facilities. Adequate and convenient sampling facilities shall be provided to allow the Inspector to obtain representative samples from the full width and depth of the discharge area of each aggregate bin. The sampling tray shall be structurally supported during the sampling operation. Access to the sampling facilities shall be provided requiring no more difficulty than that to climb a ladder leading to a secure platform with railings.

D. Inspection. The Engineer or his authorized representative shall have access at any time to all parts of the plant for:

1. Inspections of the conditions and operations of the plant.

2. Confirmation of the adequacy of the equipment in use.

3. Verification of the character and proportions of the mixture.

4. Determination of temperatures being maintained in the preparation of the mixtures.

5. Inspection of incidental related procedures.

3.03 PREPARATION OF MIXTURES

A. Preparation of Asphalt Cement. Place bituminous materials in the mixer at a temperature between 275 and 375°F., as directed.

B. Preparation of Mineral Aggregate: Thoroughly dry and heat aggregates before placing them in the mixer. Control the temperature of the aggregates so that the temperature of the complete mixture shall be within the range specified in paragraph C. below.

C. Preparation of Bituminous Concrete Mixtures: Combine the heated and dried aggregates and mineral filler and convey them into the mixer in the proportionate amounts of each size required to meet the job-mix formula. After these materials have been mixed for the specified dry-mixing time, add the asphalt cement and mix for the specified wet-mixing time. Measure asphalt cement by weight or by an approved metering device. The temperature of the mixture when discharged shall be between 275 and 325°F.

3.04 TRANSPORTATION AND DELIVERY OF MIXTURES

A. Vehicles for transportation of mixtures from the plant to the jobsite shall be clean of all foreign materials, tight, and evenly and lightly coated with a suitable thin oil or approved soap solution. No excess of lubricant shall be allowed to accumulate in low spots in the body. When necessary, vehicles shall be insulated so that the mixture is delivered for placement at the proper temperature.

B. Arrange dispatching of trucks from the plant so that all material which is delivered to the jobsite during any day shall be placed and shall have received final compaction before nightfall of the same day, unless satisfactory artificial light is provided.

C. Do not transport mixtures such a distance that segregation of the ingredients takes place or that any crust is formed on the top, bottom, or sides of the mixture which will not crumble or flatten out when the mixture is dumped, or which might otherwise be deleterious to the mixture in place on the work.

D. During transportation of the mixture from the plant to the spreader at the jobsite, keep the mixture fully covered at all times with canvas or other suitable material of sufficient size and thickness to furnish complete protection.

E. Deliver the mixture to the jobsite at a temperature governed by the air temperature in the shade and away from artificial heat, as follows with a tolerance of ±20°F:

1. Normal Layered Construction:

Air Temperature	Delivered Mix Temperature
35°F.	300°F.
40°F.	290°F.
65°F.	280°F.
90°F and over	275°F.

2. Deep Lift Paving (3 in. and over), Binder Course only:

Air Temperature	Delivered Mix Temperature
35°F.	280°F.
40°F.	270°F.
65°F and over	260°F.

3.05 TACK COAT

A. Place a tack coat emulsion RS-1 on the Binder Course prior to the Top Course construction. Following the application of the tack coat, allow time for the emulsion to break. Never apply an emulsion tack coat to a cold pavement (temperature near freezing point).

B. Clean the existing surface of all foreign matter and loose material before applying tack coat. Apply the tack coat by mechanical means at residual rate of 0.035 gsy.

3.06 SPREADING AND FINISHING

A. General:

1. Place bituminous concrete in courses as indicated.

2. When an existing surface or new base, upon which the bottom course is to be laid, contains unsatisfactory irregularities, in the Engineer's judgment, eliminate such irregularities by placing and compaction of mixture, so as to furnish a surface with true contour and grade before placing any specified bottom course.

3. Give special attention to proper testing of the surface of each course with a straightedge. Finished surfaces shall be even and uniform throughout.

4. Remove and replace with new mixture any mixture which becomes loose or broken, mixed with dirt, or defective in any way. Finish and compact the repaired area to conform to the surrounding area. Remove and replace areas of 1 sq ft or more showing an excess of bitumen.

5. No mixture shall be placed unless the breakdown and intermediate rolling can be completed by the time the material has cooled at 175°F, and provided that the density of the pavement attains at least 95% of the laboratory compacted density.

B. Spreading and Finishing Equipment:

1. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture to line, grade, width, and crown by means of fully automated controls for both longitudinal and transverse slope.

2. The pavers shall be equipped with hoppers and distributing screws of the reversing type to place the mixture evenly in front of adjustable screeds. They shall be equipped with a quick and efficient steering device and shall have reverse as well as forward traveling speeds.

3. The pavers shall employ mechanical devices such as equalizing runners, straight edge runners, evener arms or other compensating devices to adjust the grade and confine the edges of the mixture to true lines. They shall be capable of spreading the mixture without segregation in layers to the depths and widths required. They shall be equipped with blending or joint leveling devices for smoothing and adjusting all longitudinal joints between adjacent strips or courses of the same thickness.

4. The screed shall be adjustable for profile and shall have an indicating level attached.

5. An approved device will be required for heating the screed to the temperature required for the laying of the mixtures without pulling or marring.

6. The term "screed" includes any "strike-off" device operated by cutting, crowding, or other practicable action, which is effective on the mixtures at permissible workable temperatures without tearing, shoving, or gouging and which produces a finished surface of the evenness and texture required.

7. The pavers employed on projects requiring in excess of 15,000 tons shall operate by the use of a sensing grid for operation to a stringline and matching shoe for joints.

8. The paver shall be provided with a "ski" which may be employed for paving on the previously laid bituminous concrete base, or binder as directed or permitted by the Engineer.

9. The paver employed on deep lift construction shall be capable of satisfactorily feeding the mix without intermittent stopping during the discharge of the mix from the trucks into the paving machine.

10. If during construction, it is found that the spreading and finishing equipment in use leaves tracks or indented areas or produces other permanent blemishes in the pavement which are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued and other satisfactory spreading and finishing equipment shall be provided.

11. Complete all compaction rolling before the bituminous concrete temperature drops below 185°F.

C. Machine Spreading:

1. Deposit mixtures in the approved mechanical spreader, spread immediately, and strike off in a uniform layer to the full width required and to such depth that each course, when compacted, shall have the required thickness and shall conform to the indicated grade and cross section contour.

2. Deposit mixture in the center of the hoppers, exercising care to avoid overloading and spilling. Operate the pavers, while the mixture is being spread, at a speed which will produce a uniform surface texture.

3. Immediately after each course is screeded and before roller compaction is started, check the surface, adjust any irregularities, remove accumulation from the screed by rake or lute, and remove and replace any unsatisfactory spots in the course. Correct irregularities in line and grade along outside edges by addition or removal of material before the edge is rolled. Indiscriminate casting of mix on the new screeded surface, where irregularities are not evident, will not be permitted.

4. All edges shall be true and uniform.

D. Hand Spreading:

1. Spreading by hand methods will be permitted only for particular locations in the work which because of irregularity, inaccessibility or other unavoidable obstacles do not allow mechanical spreading and finishing.

2. When hand spreading is permitted, place the mixture by dumping on approved steel dump sheets outside the area upon which it is to be spread; or by other approved methods. Immediately thereafter, distribute the mixture into place by means of hot shovels, and spread it with hot rakes or lutes in a loose layer of uniform density and correct depth. Tines of the rakes shall be not less than 1/2 in. longer than the loose depth of mixture, and spaces between tines shall be not less than 1 in.

3. Do not dump loads faster than they can be properly handled by the shovelers, and do not distribute the dumped load faster than it can be properly handled by the rakers. Rake carefully and skillfully to avoid segregation and so that, after the first passage of the roller over the raked mixture, no back patching will be necessary.

3.07 COMPACTION

A. Compaction Equipment:

1. After the paving mixture has been properly spread, initial compaction shall be obtained by the use of power rollers of approved design and weight per inch width of roller. The rollers shall be steel-wheeled supplemented with pneumatic-tired rollers where required, or where permitted, vibratory rollers.

2. Steel wheel rollers for initial and intermediate rolling shall have a weight of not less than 240 pounds per inch width of tread; for top course, minimum weight shall be 285 pounds per inch width of tread.

3. Pneumatic-tired rollers, when conditions warrant, shall be provided with devices capable of varying tire pressures. When the mixture being spread by each paver requires more than the minimum number of steel wheel rollers, at least one of the additional rollers for each paver shall be a pneumatic-tired roller, except where the use of a vibratory roller is permitted. When using a pneumatic-tired roller, care shall be taken that initial rolling by the steel wheel roller be restricted to one pass whereupon the pneumatic-tired roller shall immediately follow the initial steel wheel rolling.

4. Vibratory steel drum rollers shall not be used on top course mix or structures. The machine shall have a device registering the number of vibrations per minute and a tachometer shall be provided to the Engineer in order to check the operation of the roller.

5. The V.P.M. on base and binder course material shall be a minimum of 1,400 V.P.M. and a maximum of 1500 V.P.M., or in accordance with the recommendations of the manufacturer, when approved by the Engineer.

6. The vibratory roller shall be operated with the vibrating drum in the direction of the paver and the vibrating action of the roller shall be completely shut off during change of direction and care exercised to start this action only when the roller is in motion. In order to prevent creeping and aggregate crushing during rolling of layered pavement, care shall be taken not to exceed one pass in the direction of the paver with vibrator in action and one return in a static condition and for deep lift pavements these passes shall not exceed two operations in each direction, except that the number of vibratory passes in either direction may be varied in order to obtain the required density.

7. A smoothing roller of either the pneumatic-tired or steel-wheeled type shall be used immediately behind the last pass of the vibrating roller. The use of a vibratory roller may be suspended by the Engineer if, in his opinion, unsatisfactory results are being obtained, and no further mix shall be spread until a sufficient number of approved rollers are on the project to satisfy the compaction requirements.

8. A plate shall be attached to each roller which shall show the ballasted and unballasted weight per inch width of tread.

9. The number of rollers and passes required shall be governed by the compaction results; however, at least one steel roller shall be provided for each paver employed on the paving operation. This is independent of the requirements of the pneumatic-tired roller.

B. Compaction Procedures:

1. Roll the mixture longitudinally, diagonally, and transversely as may be necessary to produce the required contour for surface. Start longitudinal rolling at the side and proceed toward the center of the pavement, except on superelevated curves start at the low side and progress to the high side, overlapping on successive trips by at least 12 in.

2. Continue the rolling so that all roller marks, ridges, porous spots, and impressions are eliminated, and the surface has the required contour and grade. Maintain the motion of the rollers at all times slow enough to avoid any displacement of the hot mixture. Correct any displacement or marring of the surface resulting from reversing the direction of the roller or from any other cause.

3. To prevent adhesion with the mixture, keep the wheels of steel rollers lightly moistened with water. Excess water or oil for this purpose will not be permitted.

4. To prevent "rolloff" of the pavement edges and longitudinal joints on deep lift paving, leave the outer 8 in. of the deep lift mixture unrolled until the temperature of the mix ranges between 150 and 180°F., whereupon compact it with a steel roller.

5. Along curbs, structures, and all places not accessible with a roller, compact the surface thoroughly with mechanical tamping devices, smooth and true to established line, grade, and contour.

6. The densities of compacted bituminous concrete shall not be less than 95% of the density obtained from laboratory compaction of a mixture composed of the same material in like proportions or 92% maximum theoretical density of said mixture. The Authority shall conduct confirmatory testing.

3.08 JOINTS

A. Place mixture as nearly continuously as possible. Pass the roller over the unprotected end of newly placed mixture only when the placing of the course is to be discontinued for such length of time as will permit the mixture to attain initial stability. In all such cases, including the formation of joints as herein specified, provide for proper bond with the new surface for the full specified depths of the courses.

B. Maximum length of longitudinal joint shall be such that the temperature of the mixture at the joint shall not be less than 150°F, when the abutting mixture is placed.

C. Make longitudinal and transverse joints in a careful manner, well bonded and sealed, true to line and grade. Where directed, cut back longitudinal and transverse joints to expose the full depth of the course and, when laying of the course is resumed, paint the exposed edge of the joint with a thin coat of bitumen. Carefully rake the new mixture against the joint, then thoroughly tamp and roll.

D. In making joints along any adjoining edge such as curb, gutter, or an adjoining pavement, and after the mixture is spread by the paver, place by hand just enough of the hot material to fill any space left open. Set up these joints with the back of a rake at the proper height and level to receive the proper compaction.

E. Stagger longitudinal joints in successive courses so that there is a minimum of 1 ft overlap between longitudinal joints in adjacent courses.

F. Overlap the rolling of successive widths of courses so as to leave smooth, uniform joints and cross sections.

3.09 FIELD QUALITY CONTROL

A. Test the plane of the finished surfaces of base, binder, and surface courses with a 16 ft straightedge, except use a 10 ft straightedge on vertical courses and on the top course of resurfaced streets which contain manhole covers, valve boxes, and the like.

B. Carefully apply the straightedge immediately after the first compaction by rolling, and from then on as may be necessary until and after the final compaction of the material in place. Hold the straightedge in successive positions parallel to the road centerline and in contact with the road surface; check the entire area from one side of the pavement to the other.

C. Correct irregularities, which vary 3/8 in. from a true finished surface in base and binder courses, and 1/4 in. in top courses.

D. Irregularities which may develop before the completion of rolling and while the material is still workable, may be remedied by loosening the surface mixture and removing or adding material as necessary. Should any unsatisfactory irregularities or defects remain after final compaction, correct the defective work by removing and replacing with new material to form a true and even surface.

3.10 OPENING TO TRAFFIC

A. No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained, and the material has cooled sufficiently to prevent distortion or loss of fines, and the pavement has achieved a maximum temperature of 140°F.

B. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for curb and gutters work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 321613

CURB AND GUTTERS

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. This Section specifies the construction of Vertical Granite Curbs (VGC).

1.03 RELATED WORK

1. Section 310000 – EARTHWORK.

2. Section 033000 – CAST-IN-PLACE CONCRETE.

1.04 QUALITY ASSURANCE

A. Tolerances for Vertical Granite Curbing: Install Vertical Granite Curbing within 1/4 in. of the indicated elevation and deviating not more than 1/8 in. per segment. Additionally, under no circumstances shall the Vertical Granite Curbing exceed the limitations in the applicable accessibility regulations.

B. Provide strict compliance with requirements for air entrainment and curing.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Concrete: Section 033000 – CAST-IN-PLACE CONCRETE, 5,000 psi.

B. Preformed Joint Filler: AASHTO M153.

C. Hot-Poured Joint Sealer: AASHTO M173.

D. Gravel Base: Section 310000 – EARTHWORK.

E. Concrete Curb: CT DOT 8.11.

F. Vertical Granite Curb: Hartford DPW Specifications for Standard Roadway Specification 0100101.

PART 3 – EXECUTION

3.01 PREPARATION

A. Excavate for and prepare the subgrade as specified in Section 310000 – EARTHWORK, true to the indicated grade and cross section.

B. Place and compact a foundation of Gravel Base to the indicated thickness upon the prepared subgrade.

C. Install new Vertical Granite Curb as indicated on the drawings and as specified herein.

D. Test completed gravel foundation with a template supported on the side forms, prior to concreting.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for curb and gutters work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 330000

EXISTING SITE UTILITIES

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Work Included: This Section specifies the maintenance, support, protection, relocation, reconstruction and adjustment-to-grade, restoration, and abandonment of existing utilities affected by the construction work.

B. For the purpose of this Section, utility means any public or private service, such as electric light and power systems; gas distribution systems; telephone, communication services; water distribution; storm drain and sanitary sewer services; fire protection systems; traffic signs and signals.

1.03 GENERAL

A. The location of existing underground pipes, cables, conduits, and structures as shown have been collected from the best available sources and the Authority together with its agents does not imply or guarantee the data and information in connection with the underground pipes, cables, conduits, structures and other parts as to their completeness nor their locations indicated. The Contractor shall contact utility owners and request marking location of all their lines in the work areas. The Contractor shall assume there are existing water, gas, electric and other utility connections to every building and structure, whether they appear on the Drawings or not. Any expense and/or damage to these shall be the responsibility of the Contractor.

B. Foundations and lines for all services may not be shown on the Drawings. The appropriate utility companies and/or agencies shall be contacted and consulted for locations of the above.

C. All utility companies, public and private, shall be notified, including those in control of utilities not shown on the Drawings (see Chapter 23 of the Connecticut General Statues) prior to designing, excavating, installing, backfilling, grading, or restoring pavement. The Contractor shall Premark the area of excavation or work and call

Before you Dig([800]-922-4455) at least three business days prior to any excavation or work. In addition, notification shall be given to all affected private and/or public utilities to permit street marking of their lines.

D. Some unknown utilities may exist in the areas to be excavated. The Contractor shall take the necessary precautions when excavated in areas of potential utility conflict. Precautions may include, but are not limited to soil vacuum excavation, hand digging, or other non-destructive means. The Contractor shall further be prepared to pre-excavate or pre-trench to locate potential utility conflicts prior to performing such activities as, but not limited to jacking, tunneling, installing temporary excavation support, etc.

E. Interruptions of utilities shall not be permitted without written consent of the utility owner. The Contractor shall coordinate with all utilities and provide all temporary utilities and connections to avoid interruptions.

1.04 SUBMITTALS

A. Submit working drawings and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of the existing utility work. Show actual location of existing utility facilities; interferences which these facilities present to the new work; location of settlement markers; method proposed to proceed with the construction; details of proposed support systems; and, if applicable, method of testing and procedure for restoration.

B. Submit written evidence of affected utility owners' approval of the details, procedure, and scheduling.

C. Provide written notice two weeks in advance of the intended date to commence operations, to affected utility owners and parties having surface, subsurface, or overhead structures in the construction area. Furnish the Engineer copies of all notices.

D. If a settlement or movement monitoring system is required, submit copies of readings to the Engineer and affected utility owner within 24 hrs of the reading.

E. Submit to the Engineer, certifications from the respective suppliers that the products to be incorporated in the work are in conformance with applicable requirements.

1.05 NOTIFICATION

A. Notify the appropriate utility agencies and the Engineer at least 48 hrs prior to starting any work involving or adjacent to utility service facilities.

B. Where an existing utility facility is encountered that is not indicated or that is determined to be a different utility facility than that indicated, promptly notify the

Authority. The Contractor is responsible for determining the owner of the facility and the disposition of the facility.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. Conform to the specifications and standard practices of the affected utility owners. Coordinate with utility owners, which work shall be done by the Contractor and which work shall be done by utility owner at Contractor's expense. Ensure continuity of all existing utility services to all users except when the utility owner determines that temporary interruption is required.

B. Unless otherwise indicated or authorized in writing by the Engineer, maintain all utility facilities complete in place.

C. Abandoned Facilities:

1. Demolish and remove abandoned utility facilities in conflict with work.

2. Do not undertake demolition or removal of the service until written approval for such work has been obtained from the utility owner.

3. When abandoned facilities are indicated to be left in place, plug, or cap or bulkhead the ends of conduits and pipes, as indicated. Pipe or conduit greater than 15 in. in diameter shall be completely filled with Controlled Density Fill. Remove abandoned utility manholes, junction boxes, and similar structures to a minimum depth of two feet below finish grade and fill the remaining void with sand or select fill, as specified in Section 310000 - EARTHWORK, after the plugging, or capping, or bulkheading of conduits and pipes has been completed. Puncture or break the bottom slabs of manholes and similar structures to provide drainage. Backfill and compact excavations resulting from removal of utility facilities, as required.

4. Bulkheads for pipes greater than 15 in. in diameter shall be constructed of solid concrete masonry bricks or solid concrete masonry blocks with full mortar joints. The bulkhead shall be watertight. Recess the bulkhead 1/2 in. and seal with non-shrink grout.

D. Provide, install, and maintain all temporary facilities required to provide interim utility service when a utility facility is to be relocated and when a utility facility to be replaced is abandoned prior to replacement.

E. Where an existing utility facility is encountered which is not indicated, or which is determined to be a different utility service than that indicated, promptly notify the Engineer who will assist in determining the owner of the facility and the disposition of the facility.

F. If, upon exposure, the condition or location of a facility to be supported complete-in-place is found by the Engineer to be unsafe for support or for maintenance of service, replace or reconstruct the facility as required, with prior approval of the Engineer and the affected utility owner.

3.02 SETTLEMENT OR MOVEMENT

A. Provide suitable settlement or movement monitoring systems as required by the affected utility owner.

B. In case of settlement or other movement which might cause damage, take immediate remedial measures to correct the conditions and damages caused by the settlement.

3.03 RECONSTRUCTION AND ADJUSTMENT-TO-GRADE

A. Relay, reset, or otherwise reconstruct miscellaneous structures and facilities as indicated.

B. Adjust-to-grade manholes and inlets as indicated, by raising or lowering the upper portion thereof.

C. Backfill under utilities supported or exposed using controlled density fill to allow for the proper support and compaction under the utility. Contractor shall coordinate with the utility owner to determine the acceptability of the use of controlled density fill and shall work with the Owner to develop alternate means to ensure the proper backfill and compaction under the utility.

3.04 AS-BUILT UTILITY LOCATION AND CONDITION SURVEY

A. For each new or relocated utility installed, including those installed or relocated by others in the Project Area, perform an as-built location survey by coordinates prior to backfilling the excavation.

B. The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Connecticut.

C. A complete digital base plan shall be provided in AutoCAD DWG format, properly referenced to the coordinate system established in the contract. The following standards shall be applicable:

1. Text: Text shall be drawn using a STYLE of "L100-XX" (where XX refers to the plotted scale) and a font file of "SIMPLEX" as defined in the AutoCAD survey template provided by the Engineer. The style shall be defined as a "fixed height" style, and have a height of 0.10 times the drawing plotted scale. (i.e., 4.0 for 40 scale plan, 2.0 for 20 scale etc.).

2. Precision and Accuracy:

a. Horizontal Survey:

(1) Precision: Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.

(2) Accuracy: No more than 10% of the survey points shall be in error by more than 1/100 in. or 0.25 mm when viewed at the requested scale.

b. Vertical Survey:

(1) Precision: Vertical Control shall have a maximum error of closure no greater than .075 ft or .02 meters.

(2) Accuracy: No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.

3. Surface Data: The data format shall conform to Autodesk Land Development Desktop Project files and represented as a TIN (Triangulated Irregular Network) of 3D lines on a separate, distinct layer within the AutoCAD drawing file. 3D faces or 2-dimensional lines are NOT acceptable.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for existing utility work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

4.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

SECTION 334200

STORMWATER SYSTEMS

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. Work Included: This Section specifies the following items:

1. Engaging Independent testing agency for required testing.
2. QA/QC procedures and associated submittals.
3. Storm Sewer Pipes and Fittings.
4. Drainage Manholes.
5. Frames and Covers for Drainage Structures.
6. Non-pressure transition couplings.
7. Cleanouts.
8. Providing an as-built survey of the constructed Drainage work.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 310000 – EARTHWORK.
2. Section 033000 – CAST-IN-PLACE CONCRETE.

1.03 PROJECT CONDITIONS

A. The Contractor shall make his own assessment of existing conditions, including adjacent property and the possible effects of his proposed temporary works and construction methods, and shall develop methods and phasing, which will assure safety to the public, adjacent property, and the completed Work.

B. Contractor shall confirm all proposed invert elevations for the proposed drainage system at all anticipated crossings, whether shown on the Drawings or not, and including the invert of the existing connection prior to constructing and/or installing any storm drainage piping and structures. The Contractor shall submit this information to EOR for review and approval prior to constructing any affected work.

C. Interruption of Existing Storm Drainage Services: Do not interrupt the service of existing Drainage Services unless permitted under the following conditions and then only after arranging to provide temporary service as required by the Authority and Engineer:

1. Notify Engineer and Authority no fewer than two days in advance of proposed interruption of service.

2. Do not proceed with the interruption of service without the Authority's written permission.

D. Where an existing utility is encountered that is not indicated or that is determined to be a different utility than that indicated, promptly notify the Engineer. The Contractor is responsible for identifying the utility, determining the owner of the utility, and if the utility is still in use, or suitable for removal or abandonment.

1.04 QUALITY ASSURANCE

A. Do not commence drainage construction operations until temporary erosion and sedimentation control measures are in place and in conformance with Section 015713 – TEMPORARY EROSION AND SEDIMENTATION CONTROL.

B. The Engineer's duties do not include the supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the Contractor from defects discovered in his Work at that time or subsequent to the testing.

1.05 PROTECTION OF WORKERS

A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926. Contractors shall be familiar with the requirements of these regulations.

B. The Contractor is responsible for the adequacy of any excavation support systems necessary to install drainage structures and piping and shall retain the services of a Professional Engineer registered in Connecticut to design the required excavation support systems as required. The Contractor's Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support systems and shall design in conformance with OSHA

requirements. The Contractor's Professional Engineer shall provide sufficient on-site inspection and supervision to assure that any excavation support systems necessary are installed and function in accordance with their design. Criteria listed herein defining the responsibilities of the Contractor's Professional Engineer are minimum requirements.

1.06 REFERENCE STANDARDS

A. Follow the guidelines contained in the latest editions of the following codes, specifications, and standards, including references contained in each document, except where more-stringent requirements are shown or specified.

B. City of Hartford, Connecticut Department of Public works Standard Technical Specifications for Streets, Roads, Traffic, and Streetscape Construction.

C. The Metropolitan District (MDC) Project Manual.

D. ASTM International:

1. ASTM A536 – Standard Specification for Ductile Iron Castings.

2. ASTM C478 – Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.

3. ASTM C890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

4. ASTM C891 – Standard Practice for Installation of Underground Precast Concrete Utility Structures.

5. ASTM C913 – Standard Specification for Precast Concrete Water and Wastewater Structures.

6. ASTM C923 – Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.

7. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

8. ASTM C1173 – Standard Specification for Flexible Transition Couplings for Underground Piping Systems.

9. ASTM D3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

10. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

11. ASTM D4101 – Standard Specification for Polypropylene Injection and Extrusion Materials.

12. ASTM D5926 – Standard Specification for Poly (Vinyl Chloride) (PVC) Gaskets for Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems.

13. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

14. ASTM F1417 – Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air.

15. ASTM F1554 – Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

16. ASTM F1668 – Standard Guide for Construction Procedures for Buried Plastic Pipe.

1.07 DEFINITIONS

A. Manhole: Underground reinforced concrete structure with solid cover used as a junction structure to make pipe connections of two or more pipes.

B. PVC pipe: Pipe made of polyvinyl chloride material.

C. Utility: Any public or private service, such as electric light and power systems; gas distribution systems; telephone, and other communication services; water distribution; storm drain and sanitary sewer service.

1.08 PRECONSTRUCTION MEETINGS

A. Preconstruction Conference: Conduct pre-construction conference at the Project site fourteen days prior to the start of work.

B. Review methods and procedures related to drainage, including, but not limited to, the following:

1. Planning of installation operations.

2. Personnel and equipment needed to make progress and avoid delays.

3. Coordination of Work with utility locator service.

4. Field quality control and acceptance testing.

1.09 SUBMITTALS

A. Submit shop drawings prepared by a registered professional engineer in the state of Connecticut to the EOR for review and approval in accordance with the requirements of the Contract Drawings

B. Product Data & Certificates: Submit to Engineer for approval each product indicated herein prior to construction.

C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show all anticipated crossings and clearances. Indicate interface and spatial relationship between manholes, piping, and proximate structures and utilities. The Contractor shall submit this information to EOR for review and approval prior to constructing any affected work.

D. Existing Utility Drawings: Submit working drawings, and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of work related to existing utilities. Show actual location of existing utilities encountered and any interfering present to the new drainage work. Show the method proposed to proceed with the construction; details of support systems; and if applicable, method of testing and, if applicable, procedure for restoration.

E. Submit written evidence of affected utility owner's approval of details, procedure, and scheduling.

F. As-built Survey Drawings: Show system piping in plan and profile elevation. Draw profiles at horizontal scale of not less than 1 in. equals 50 ft and vertical scale of not less than 1 in. equals 5 ft. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.

G. Field Quality-Control Reports: For all testing required per this section.

1.10 FIELD QUALITY CONTROL

A. Drainage Structures, Leakage Tests:

1. The manholes shall be made as nearly watertight, as practicable.

2. The Contractor shall perform leakage tests on each manhole installed using an approved low air pressure testing system. This type of test shall be used only immediately after assembly of the manhole and only prior to backfilling. The manhole to pipe connection should only be a flexible connector. All lift holes shall be plugged with a non-shrinking mortar. For this test, each manhole shall be tested under 10 in. Hg vacuum. The test shall pass if the

vacuum remains at 10 in. Hg or drops no lower than 9 in. Hg after 60 sec for 4 or 5 ft manholes from 0 to 10 ft deep, 75 sec for 4 or 5 ft manholes from 10 to 15 ft deep, or 90 sec for 4 or 5 ft manholes from 15 to 25 ft deep. A volume equivalent shall be calculated for larger diameter manholes to determine the testing length based on these parameters.

B. Storm Drainage Pipe Acceptance Testing:

1. Inspect the interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 in. of backfill is in place, and again at completion of Project.

   a. Submit separate reports for each system inspection.

   b. Defects requiring correction include the following:

      (1) Alignment: Less than full diameter of inside of pipe is visible between structures.

      (2) Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5% of piping diameter.

      (3) Damage: Crushed, broken, cracked, or otherwise damaged piping.

      (4) Infiltration: Water leakage into piping.

      (5) Exfiltration: Water leakage from or around piping.

   c. Replace defective piping using new materials and repeat inspections, until defects are within allowances specified.

   d. Re-inspect and repeat procedure until results are satisfactory.

2. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

   a. Do not enclose, cover, or put into service before inspection and approval.

   b. Submit separate report for each test.

3. Gravity-Flow Storm Drainage Piping, test according to the following:

   a. Exception: Piping with soil tight joints.

b. Test plastic piping according to ASTM F1417.

c. Test concrete piping according to ASTM C969.

d. Test Manholes according to ASTM C1244.

4. Leaks and loss in test pressure constitute defects that must be repaired.

5. Repair defective items and repeat testing until leakage is within allowances specified

1.11 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with water.

1.12 AS-BUILT UTILITY LOCATION AND CONDITION SURVEY

A. For new drains, removed, abandoned, or relocated utility, perform an as-built location survey prior to backfilling the excavation.

B. The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Connecticut.

C. A complete digital base plan shall be provided in AutoCAD DWG format Release 2000i or later, properly referenced to the project coordinate system. The following standards shall be applicable:

1. Horizontal Survey:

a. Precision: Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.

b. Accuracy: No more than 10% of the survey points shall be in error by more than 1/100 in. when viewed at the requested scale.

2. Vertical Survey:

a. Precision: Vertical Control shall have a maximum error of closure no greater than .075 ft.

b. Accuracy: No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products used at interface with utility companies shall conform to the requirements of connected utility companies.

2.02 PVC PIPE AND FITTINGS:

1. All PVC pipe shall be continuously and permanently marked with the manufacturer's name, pipe size, and pressure rating or stiffness in psi (kpa).

2. The Contractor shall also require the manufacturer to mark the date of extrusion on the pipe. This dating shall be done in conjunction with records to be held by the manufacturer for 2 years, covering quality control tests, raw material batch number, and other information deemed necessary by the manufacturer.

3. Pipe:

   a. All PVC pipe shall be joined by compression of watertight joints, unless otherwise shown or specified, and shall conform to the following requirements:

   b. Non Perforated Polyvinyl chloride pipe (PVC) shall conform to the requirements of ASTM D3034, Class SDR 35. Material for PVC pipe shall conform to the requirements of ASTM D1784 for Class 12454-B or 12454-C as defined therein. All diameters shall be as specified on the Contract Drawings.

   c. Elastomeric seals for watertight joints for PVC pipe and fittings shall conform to the requirements of ASTM D3212.

   d. Service pipes for storm services shall be minimum of 6 in. and shall match the diameter of existing services for reconnections.

4. Fittings:

   a. All fittings shall conform to the requirements of ASTM D3034 or ASTM F679. The ring groove and gasket ring shall be compatible with PVC pipe ends. The flanged fittings shall be compatible with cast-iron or ductile iron pipe fittings.

   b. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.

c. PVC pipe fittings shall be full-bodied, either injection molded, or factory fabricated. Saddle-type tee or wye fittings are not acceptable.

5. Gaskets: Flexible elastomeric rings conforming with ASTM F477.

2.03 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Plastic Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.

2.04 MANHOLES

A. Standard Precast Concrete Manholes:

1. Provide Manholes designed for structural loading as indicated on the Contract Drawings and in accordance with the following:

a. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.

b. Diameter: 60 in. minimum, unless otherwise indicated. Refer to the plans for diameter.

c. Base Section: 6 in. minimum thickness for floor slab and 4 in. minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.

d. Riser Sections: 4 in. minimum thickness, and lengths to provide depth indicated.

e. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated on drawings, and top of cone of size that matches grade rings.

f. Joint Sealant: ASTM C990, bitumen or butyl rubber.

g. Pipe Connectors: ASTM C923, cast or fitted into manhole walls, for each pipe connection.

h. Steps: Deformed, 1/2 in. steel reinforcing rods encased in ASTM D4101, PP, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12 – 16 in. intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 in.

i. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.

j. Grade Rings: Reinforced-concrete rings, 6 – 9 in. total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

k. Frame and Cover: Refer to the Drawings for type.

2.05 CONCRETE

A. Concrete, General: Section 033000 – CAST-IN-PLACE CONCRETE.

B. Manholes and Other Load-Bearing Drainage Structures: Class 5000-3/4.

2.06 PVC CLEANOUTS

A. Provide cleanout cast iron frame and cover, ASTM A536, capable of withstanding HS-20-44 traffic loads at finish grade. Refer to the drawings for location.

B. Pipe Fitting and Riser to Cleanout: Provide PVC riser pipe. Refer to the fittings sections for piping to wye branch connection and wye branch to PVC connection.

2.07 CEMENT MORTAR

A. One part Portland cement, two parts sand by volume with sufficient water to form a workable mixture, mortar minimum strength of 3,000 psi.

2.08 FRAMES AND COVERS

A. Frames and covers shall be heavy-duty and conform to the City of Hartford, Connecticut Department of Public Works requirements.

B. Iron castings shall be true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow-holes and other defects affecting the strength and value for the service intended. The finished coating shall be tough and tenacious

when cold and not brittle or with any tendency to scale off under seasonable temperature changes.

C. Frames and covers shall be Cast Iron, Class 30B conforming to ASTM A48, and as follows: Castings to be free from scale, lumps, blisters and sandholes. Machine contact surfaces to prevent rocking. Thoroughly clean and hammer inspect.

D. Frames and covers shall be capable of withstanding HS-20-44 loading unless otherwise indicated or specified.

E. The Contractor shall furnish all manhole frames and covers conforming to the details shown on the drawings, or as herein specified. Frames and covers shall be of grey iron with diamond cover surface design. Manhole covers shall be machined to fit securely and evenly on the frame.

F. Covers for all structures shall have the word “DRAIN” or other appropriate designation cast upon them.

2.09 TEST PITS

A. Provide plan and profile sketches identify utilities uncovered during test pit operation.

PART 3 – EXECUTION

3.01 GENERAL

A. Excavation. Excavate trenches as specified in Section 310000 – EARTHWORK.

B. Bedding. Refer to Section 310000 – EARTHWORK.

C. Pipe Laying. Lay all pipe in accordance with the manufacturer's written instructions. Additional requirements for specific types of the pipe are included in subsequent articles herein.

D. Structures. Construct manholes and other related drainage structures in connection with the installation of pipe. Install or cut pipe flush with the inside face of structure walls.

E. Protection:

1. Protect joint materials from the air and sun to prevent drying and other deterioration.

2. Take precautions to prevent flooding of trench prior to backfilling.

3. Do not allow free water to come in contact with pipelines, until Portland cement joint and sealing materials have set for at least 24 hrs.

F. Backfill. Backfill trenches as specified in Section 023000 – EARTHWORK.

3.02 PIPING INSTALLATION

A. Install gravity-flow, non-pressure piping according to the following:

1. Install piping pitched down in direction of flow.

2. Install PVC piping according to ASTM D2321 and ASTM F1668.

Note: Conflicts between the foregoing references and these Specifications are not intended. In the event of a conflict, the more restrictive shall govern.

B. Confirm the invert elevation of the proposed outfall connection, and verify clearances with all anticipated crossings, prior to constructing and/or installing any storm drainage piping and structures. The Contractor shall submit this information to Engineer for review and approval prior to constructing any affected work.

C. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout takes into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

D. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

E. Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid, unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 in./ft of length. If a piece of pipe fails to meet this requirement for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective, either before or after installation, shall be removed and replaced.

F. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.

G. All pipe and fittings shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work.

H. Pipe and fittings shall be installed to the lines and grades indicated on the Drawings. Care shall be taken to ensure true alignments and gradients.

I. Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber or other unyielding object.

J. All joint surfaces shall be cleaned. Immediately before joining the pipe, the bell or groove shall be checked to see that the rubber ring is properly seated. Apply lubricant to the spigot end only, paying particular attention to the bevel, in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to the pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be "pulled" or "cramped" unless permitted by the Engineer.

K. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.

L. Details of gasket installation and joint assembly shall follow the directions of the manufacturers of the joint materials and of the pipe, all subject to review by the Engineer. The resulting joints shall be watertight and flexible.

M. All pre-molded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the work and shall furnish pipe from another manufacturer which will conform to all the requirements of these specifications.

N. Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.

O. After each pipe has been properly bedded, enough sand shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment.

P. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench. At all times pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs, or by other acceptable means.

Q. If water is in the trench when work is resumed, the plug shall not be removed, until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe. Pipelines shall not be used as conductors for trench drainage during construction. Install PVC pipe and fittings in accordance with manufacturer's printed instructions.

R. Allowable Pipe Deflection for PVC and PE Pipe: Pipe provided under this Specification shall be so installed as to not exceed a maximum deflection of 5.0%. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe. Upon completion of a section of pipe, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gage assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer and be reviewed by the Engineer. The section of pipe must be placed and backfilled for a minimum of ninety days before the deflection can be measured. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem without additional compensation.

S. Cleaning: Care shall be taken to prevent earth, water and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out the pipeline and manholes being careful to prevent soil, water and debris from entering any existing pipe.

3.03 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8 in. thick, brick masonry bulkheads.

2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Backfill to grade according to Section 310000 – EARTHWORK and as specified herein.

3.04 IDENTIFICATION

A. Section 310000 – EARTHWORK specifies materials and their installation. Arrange for warning tape to be installed directly over piping and at the outside edge of underground structures.

B. Use detectable warning tape over piping and over edges of underground structures.

3.05 TEST PITS

A. Perform test pits at locations shown on drawings in accordance with Section 310000 - EARTHWORK

3.06 BACKFILL

A. Partial Backfill Before Testing:

1. Deposit and compact backfill in 4 in. layers around bottom half of pipe and for full width of trench, leaving top half of pipe exposed.

2. Deposit and compact additional backfill between joints, to a depth of 12 in. above top of pipe, leaving joints exposed.

B. Final Backfill After Testing:

1. Backfill and compact as specified in Section 023000 – EARTHWORK, flush with finished grade. If permitted by the Engineer, surface of backfill may be slightly convex.

2. Restore surface to its original condition, or as required.

PART 1 – MEASUREMENT AND PAYMENT

1.01 MEASUREMENT

A. No separate measurement will be made for work listed herein, but all costs in connection therewith shall be included in the Lump-Sum price of the contract except as otherwise noted.

1.02 PAYMENT

A. Payment will be made within the lump-sum contract.

END OF SECTION

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 UNION PLACE
HARTFORD, CT

GHTD PROJECT NO. 09-025
SGH PROJECT NO. 230979.00

ISSUED FOR RE-BID

OWNER:
Greater Hartford Transit District
1 Union Place
Hartford, CT 06103

Contact: Ms. LaShaunda Drake
E-mail: LDrake@GHTD.org

CIVIL ENGINEER, DESIGNER OF RECORD AND PRIME CONSULTANT:
Simpson Gumpertz & Heger, Inc.
480 Totten Pond Dr.
Waltham, MA 02451

Contact:
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PLUMBING ENGINEER OF RECORD:

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Tel. No.: 617-337-9357
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E-mail: jsh@rwsullivan.com

ARCHITECT OF RECORD:

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E-mail: bstia@dhkinc.com

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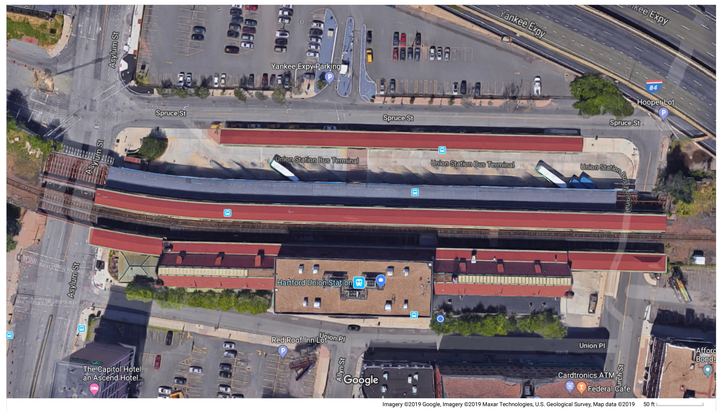


PHOTO : AERIAL VIEW



LOCUS PLAN

SIMPSON GUMPERTZ & HEGER
480 Totten Pond Road
Waltham, MA 02451
781.907.9000
sgh.com

Greater Hartford Transit District

Consultant

ISSUED FOR BID

No.	Date	Description	By
B	05/09/2025	ISSUED FOR RE-BID	SPD
A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

COVER SHEET

Drawing Title

Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	N/A

STATE OF CONNECTICUT · SEAN P. DONLON · 50647 LICENSED PROFESSIONAL ENGINEER

Seal

Drawing No.

G-0.0

GENERAL CIVIL NOTES:

PART 1 - GENERAL REQUIREMENTS AND DESIGN CRITERIA

1.1 SCOPE OF WORK
- A. PROVIDE TEMPORARY FACILITIES AND CONSTRUCTION FENCING.
- B. MAINTAIN PEDESTRIAN ACCESS TO UNION STATION, INCLUDING SIGNAGE AND REQUIRED TEMPORARY WALKWAYS AND ROUTING SIGNAGE.
- C. INSTALL ALL NECESSARY EROSION AND SEDIMENTATION CONTROLS.
- D. MAINTAIN AND REPAIR, OR REMOVE AND SALVAGE (E) BIKE RACKS WHERE INDICATED ON PLANS.
- E. REMOVE AND SALVAGE (E) BOLLARDS AND (E) SIGN WHERE INDICATED ON PLANS.
- F. DO NOT DISTURB (E) UTILITIES, AND (E) STAIRCASES AS SHOWN ON THE DRAWINGS.
- G. REMOVE AND SALVAGE SIDEWALK PAVERS AND CURB FOR TRENCH EXCAVATION. REMOVE AND DISPOSE CONCRETE SIDEWALK.
- H. REMOVE AND SALVAGE BROWNSTONE AND BRICK MASONRY FOR SECONDARY DRAIN INSTALLATION.
- I. INSTALL STORM DRAIN LINES, STORM MANHOLE, PVC CLEANOUTS, SECONDARY DRAINS DOWNSPOUT NOZZLE.
- J. REINSTALL SALVAGED PAVERS, CURBS, BIKE RACKS, AND SIGNS.
- K. REBUILD CONCRETE SIDEWALK AND HMA AS REQUIRED

1.2 GENERAL
- A. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS REQUIRED FOR CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, TEMPORARY PEDESTRIAN FACILITIES AND TEMPORARY FENCING AND SITE ACCESS. CONTRACTOR TO COORDINATE WITH HARTFORD DPW AND/OR HARTFORD MDC ON REQUIREMENTS.
- B. DEFICIENT WORK AND/OR WORK NOT IN CONFORMANCE WITH THE CONTRACT DOCUMENTS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL COMPENSATE THE CLIENT FOR SERVICES ARISING FROM DEFICIENT WORK, REVIEW OF MODIFICATIONS/CONTRACTOR SUBSTITUTION, OR EXPEDITING OF SUBMITTALS.
- C. COST OF INVESTIGATION AND/OR REDESIGN INCURRED BY THE ENGINEER OF RECORD DUE TO CONTRACTOR ERRORS WILL BE AT THE CONTRACTOR'S EXPENSE.
- D. ALL CONSTRUCTION SHALL COMPLY WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CONTRACTOR MUST COMPLY WITH CONTRACTOR REGISTRATION REQUIREMENTS OF ALL GOVERNING AUTHORITIES AND ALL WORKER SAFETY STANDARDS. WORK SHALL NOT COMMENCE UNTIL ALL PERMITS REQUIRED FOR THE SUBJECT PORTION OF THE WORK ARE OBTAINED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE ALL REQUIRED PERMITS AND/OR EVIDENCE OF COMPLIANCE WITH APPLICABLE REGULATIONS ON SITE AT ALL TIMES DURING THE EXECUTION OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL CONSTRUCTION PERMITS NOT FURNISHED BY THE OWNER, PRIOR TO THE START OF ANY CONSTRUCTION. ALL FEES AND PERMITS SHALL BE PAID FOR BY THE CONTRACTOR.
- E. APPROVED PLANS SHALL BE KEPT IN A PLAN BOX. ALL CONSTRUCTION SETS SHALL REFLECT THE SAME INFORMATION. CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF PLANS ON THE PREMISES IN GOOD CONDITION AT ALL TIMES. THIS SHALL INCLUDE ALL ADDENDA AND CHANGE ORDERS.
- F. CONTRACTOR IS TO PROTECT ALL SITE FEATURES INDICATED TO REMAIN INCLUDING BUT NOT LIMITED TO CURBS, PAVEMENT, SIGNS, LANDSCAPED AREAS ETC. AND IS TO RESTORE ANY FEATURES THAT ARE DISTURBED BY THE CONTRACTOR'S OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER.
- G. CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL WHILE WORKING IN PUBLIC OR ADJOINING PROPERTIES. ALL SIGNAGE AND TRAFFIC CONTROL DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATIONS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, ANY APPLICABLE CTDOT TRAFFIC CONTROL DESIGN CRITERIA, OR REQUIREMENTS OF THE CITY OF HARTFORD AS APPLICABLE. CONTRACTOR RESPONSIBLE FOR COORDINATING A POLICE DETAIL AS REQUIRED FOR WORK OPERATIONS. CONTRACTOR SHALL NOTIFY GHTD, EOR, AND DPW OF ANY DAYS REQUIRING PARTIAL OR FULL ROAD CLOSURE TO COMPLETE THE WORK.
- H. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY. SPECIAL PRECAUTIONS MAY BE REQUIRED IN THE VICINITY OF POWER LINES AND OTHER UTILITIES.
- I. TRUCKING ON OR ABOUT THE SITE WILL BE PERMITTED ONLY WITHIN REASONABLE LIMITS AND THE CONTRACTOR SHALL NOT UNREASONABLY ENCUMBER THE PREMISES WITH EQUIPMENT AND MATERIALS. THE STORAGE SHALL BE CONFINED TO SUCH LIMITS AS MAY BE JOINTLY AGREED UPON BY OWNER AND CONTRACTOR.
- J. FOR CONSTRUCTION DETAILS NOT SHOWN, USE THE MANUFACTURER'S APPROVED SHOP DRAWINGS / DATA SHEETS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND LOCAL REGULATIONS.
- K. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.

1.3 EXISTING CONDITIONS, SURVEY, ELEVATIONS, & DIMENSIONS
- A. ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR CLARIFICATION BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK. DIMENSIONS AND ELEVATIONS NOTED IN THE CONTRACT DOCUMENTS AS (+/-) AND ALL FIELD CONDITIONS SHALL BE VERIFIED IN THE FIELD (VIF) BY THE CONTRACTOR PRIOR TO THE SUBMISSIONS OF SHOP DRAWINGS. UPON RECEIPT OF SHOP DRAWINGS, THE ENGINEER HAS THE RIGHT TO ASSUME THAT ALL FIELD DIMENSIONS, ELEVATIONS AND CONDITIONS HAVE BEEN VERIFIED BY THE CONTRACTOR AND THAT THE SHOP DRAWINGS ACCURATELY REFLECT SUCH VERIFICATIONS UNLESS STATED OTHERWISE ON THE SHOP DRAWINGS. CONTRACTOR SHALL SPECIFY COMPONENTS TO BE CUT TO FIT IN FIELD ON SHOP DRAWINGS.
- B. ALL EXISTING CONDITIONS AND PROPERTY LINE INFORMATION ARE AS TAKEN FROM AN ELECTRONIC CAD FILE PREPARED BY LEWIS ASSOCIATES, AND DATED OCTOBER 30, 2023.
- C. UTILITIES SHOWN ARE APPROXIMATE ONLY AND WERE INTERPRETED FROM ON-SITE OBSERVATIONS AND RECORD UTILITY INFORMATION WHERE AVAILABLE. FURTHER INVESTIGATION AND SURVEY INFORMATION WILL BE REQUIRED TO VERIFY THE LOCATION, INVERTS, AND CONDITION OF ALL UTILITIES.
- D. ALL VERTICAL ELEVATIONS INDICATED ON PLANS ARE REFERENCED TO NAVD88 DATUM.
- E. HORIZONTAL DATUM IS BASED ON CT GRID SYSTEM, NAD 83.
- F. THE SITE IS NOT MAPPED WITHIN A FEMA FLOOD ZONE.

1.4 BUILDING CODES AND REFERENCED STANDARDS
- A. CONNECTICUT STATE BUILDING CODE, WHICH ADOPTS AND AMENDS THE 2021 INTERNATIONAL BUILDING CODE AND THE 2021 INTERNATIONAL EXISTING BUILDING CODE.
- B. 2010 STANDARDS FOR ADA DESIGN, DEPARTMENT OF JUSTICE, 15 SEPTEMBER 2010 also ICC/ANSI A117.1-2017
- C. CITY OF HARTFORD RULES AND SPECIFICATIONS REGULATING CURB AND SIDEWALK LAYERS AND STREET EXCAVATION, JULY 2013
- D. CITY OF HARTFORD STANDARD TECHNICAL SPECIFICATIONS

1.5 QUALITY ASSURANCE
- A. THE CONTRACTOR SHALL PERFORM ALL WORK IN STRICT ACCORDANCE WITH ALL APPLICABLE LAWS, AND REGULATIONS OF THE CITY OF HARTFORD AND WITH ALL OTHER AUTHORITIES HAVING JURISDICTION. ALL SUCH REQUIREMENTS SHALL TAKE PRECEDENCE OVER THE REQUIREMENTS OF THE SPECIFICATIONS EXCEPT IN CASES WHERE THE REQUIREMENTS OF THE SPECIFICATIONS ARE MORE EXACTING OR STRINGENT.
- B. TESTING OF MATERIALS AND INSPECTIONS OF INSTALLED WORK SHALL BE COMPLETED THROUGHOUT THE DURATION OF THE PROJECT, AS REQUIRED BY THE SPECIFICATIONS OR DIRECTED BY THE CIVIL EOR AND/OR HARTFORD DPW. THE AUTHORITY RESERVES THE RIGHT TO PERFORM INSPECTIONS AND TESTING AT ANY TIME DURING THE EXECUTION OF WORK. CONTRACTOR SHALL PROVIDE FREE AND SAFE ACCESS TO ALL RECORDS, MATERIAL STOCKPILES, AND FACILITIES FOR THE CIVIL EOR AND/OR HARTFORD INSPECTORS.
- C. THE TESTING AGENCY SHALL SUBMIT THE RESULTS OF ALL REQUIRED EARTHWORKS TESTING TO THE CIVIL EOR AND OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL.

PART 2 - SITE PREPARATION AND TEMPORARY EROSION AND SEDIMENTATION CONTROL

2.1 SCOPE OF WORK
- A. INSTALL CONSTRUCTION FENCING
- B. INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE DRAWINGS.
- C. REMOVE EROSION AND SEDIMENTATION CONTROL MEASURES ONCE ALL SITE WORK IS COMPLETE AND FINAL GROUND COVER IS ESTABLISHED.

2. REQUIREMENTS
- A. REFER TO SECTION 015710 - TEMPORARY EROSION AND SEDIMENTATION CONTROLS FOR DETAILED SUBMITTAL, MATERIALS, AND EXECUTION REQUIREMENTS.
- B. REFER TO SECTION 021000 - SITE PREPARATION FOR EXECUTION REQUIREMENTS.

PART 3 – DEMOLITION, EARTHWORK, AND GRADING

3.1 SCOPE OF WORK
- A. SAWCUT, REMOVE AND DISPOSE CONCRETE SIDEWALK AS INDICATED ON DRAWINGS.
- B. REMOVE AND SALVAGE SIDEWALK PAVERS AND CURB AS REQUIRED AND INDICATED ON THE DRAWINGS.
- C. REMOVE DEMOLISHED MATERIALS, SURPLUS SOIL MATERIAL, AND WASTE MATERIALS, INCLUDING TRASH AND DEBRIS, AND LEGALLY DISPOSE THEM OFF SITE.
- D. EXCAVATE FOR (P) DRAIN STRUCTURES, AND PIPING.
- E. COMPACT SUBGRADE AND INSTALL BACKFILL FOR (P) DRAINAGE STRUCTURES.
- F. BACKFILL TRENCHES.
- G. PERFORM FINE GRADING, PREPARE AND COMPACT SUBGRADE, AND INSTALL AND COMPACT GRAVEL BASE AT SIDEWALK AND ASPHALT AREAS.

3.2 GENERAL
- A. THE CONTRACTOR SHALL NOTIFY THE ENGINEER, THE OWNER, AND UTILITY COMPANIES AT LEAST 48 HOURS BEFORE BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY CALL BEFORE YOU DIG AT LEAST 72 HOURS PRIOR TO EXCAVATION. CALL BEFORE YOU DIG CAN BE CONTACTED AT 1-800-922-4455.
- B. DO NOT INTERRUPT UTILITIES SERVING OWNER'S FACILITIES, OR OTHER FACILITIES UNLESS PERMITTED IN WRITING BY OWNER, UTILITY OWNER, AND OWNER OF FACILITIES BEING SERVED BY THE UTILITY. PROVIDE TEMPORARY UTILITY SERVICES AS REQUIRED.
- C. PROTECT ALL OPEN TRENCHES AND EXCAVATIONS UNLESS IN AREAS OF ACTIVE CONSTRUCTION.
- D. CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING ALL EXISTING UTILITIES WITHIN PROPOSED AREAS OF EXCAVATION PRIOR TO CONSTRUCTION AND TAKE PRECAUTION TO NOT DAMAGE ANY EXISTING UTILITIES AS PART OF THE PROPOSED WORK.
- E. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL. 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.
- F. THE CONTRACTOR SHALL EXERCISE CARE WHEN OPERATING EQUIPMENT ADJACENT TO (E) STRUCTURES SO AS NOT TO CAUSE DAMAGE OR DISPLACEMENT. IF THE CONTRACTOR'S PLACEMENT AND COMPACTION OPERATIONS RESULT IN DAMAGE TO THE STRUCTURES, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR ALL DAMAGE AT NO ADDITIONAL COST TO THE OWNER.
- G. UNIFORMLY MOISTEN OR AERATE EACH SUBSEQUENT BACKFILL SOIL LAYER BEFORE COMPACTION TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT. WHEN MOISTURE CONTENT IS EXCESSIVE, DEFER COMPACTION UNTIL THE MATERIAL HAS DRIED TO SUITABLE MOISTURE CONTENT. NATURAL DRYING MAY BE ACCELERATED BY MANIPULATION TO INCREASE THE RATE OF EVAPORATION, OR BY BLENDING SIMILAR MATERIALS FROM A DRY STOCKPILE. IF DRYING IS ACCOMPLISHED BY BLENDING IN A DRY MATERIAL, TAKE CARE NOT TO EXCEED THE SPECIFIED MAXIMUM LAYER THICKNESS FOR COMPACTION. REMOVE ANY EXCESS MATERIAL FROM THE LAYER BEFORE COMPACTION.
- H. PROPOSED GRADES TO BLEND SMOOTHLY WITH EXISTING GRADES. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT GRADING MEETS ALL APPLICABLE ADA REQUIREMENTS. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE SLOPES ARE PROVIDED AND PROVIDE EOR A FINAL AS-BUILT PLAN WITH FINAL FINISHED GRADES FOR REVIEW AND APPROVAL. THE CONTRACTOR IS RESPONSIBLE TO REMOVE AND REPLACE ANY NON-ADA COMPLIANT WORK AT NO ADDITIONAL EXPENSE TO THE OWNER OR EOR.
- I. NO SLOPE SHALL EXCEED A 3:1 SLOPE.

3.3 REQUIREMENTS
- A. REFER TO SECTION 021500 - EXCAVATION SUPPORT AND PROTECTION FOR DETAILED SUBMITTAL, MATERIALS, AND EXECUTION REQUIREMENTS.
- B. REFER TO SECTION 310000 - EARTHWORK FOR DETAILED QA/QC SUBMITTAL, MATERIALS, AND EXECUTION REQUIREMENTS.

PART 4 - DRAINAGE AND SEWER SYSTEMS

4.1 SCOPE OF WORK
- A. INSPECT EXISTING ROOF DRAIN LINES PRIOR TO CONSTRUCTION AND NOTIFY EOR PRIOR TO PROCEEDING.
- B. INSTALL DMH's, ASSOCIATED DRAINS AND CLEANOUTS AS SHOWN ON THE DRAWINGS.
- C. CONSTRUCT (P) DRAINAGE SYSTEM AS INDICATED.

4.2 GENERAL
- A. CONSTRUCTION SHALL PROCEED SUCH THAT ALL STORMWATER FACILITIES WITHIN A WATERSHED AREA ARE IN PLACE AND OPERATIONAL PRIOR TO CONSTRUCTION OF IMPERVIOUS SURFACES WITHIN THAT AREA.

4.3 REQUIREMENTS
- A. REFER TO SECTION 334200 - STORMWATER SYSTEMS FOR DETAILED QA/QC SUBMITTAL, MATERIALS, AND EXECUTION REQUIREMENTS.

PART 5 - UTILITIES

5.1 SCOPE OF WORK
- A. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION

5.2 GENERAL
- A. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL UTILITY CONNECTION POINTS SHOWN ON PLAN PRIOR TO STARTING CONSTRUCTION AND SHALL IMMEDIATELY NOTIFY THE ENGINEER AND OWNER OF ANY DISCREPANCIES FOUND.
- B. ADJUSTMENT OF INLETS, JUNCTION BOXES, MANHOLE FRAMES, COVERS/GRATES, WATER VALVES, WATER METERS, GAS METERS, ETC., SHALL BE INCLUDED IN THE CONTRACTOR'S BID AND NO CLAIM SHALL BE MADE AGAINST THE OWNER OR ENGINEER FOR THESE ADJUSTMENTS, IF REQUIRED.
- C. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF THE UTILITY OWNER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PRESERVE EXISTING UTILITIES AND ANY AND ALL DAMAGE TO EXISTING UTILITIES AS A RESULT OF THE CONTRACTOR'S ACTIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

5.3 REQUIREMENTS
- A. REFER TO SECTION 330000 - UTILITIES FOR DETAILED SUBMITTAL, MATERIALS, AND EXECUTION REQUIREMENTS.

PART 6 - HMA PAVEMENT

6.1 SCOPE OF WORK
- A. FULL DEPTH HMA PAVING AT ALONG PIPE TRENCH. SEE PLANS FOR LIMITS.

6.2 STANDARD SPECIFICATIONS AND REFERENCE STANDARDS
- A. REFER TO SECTION 321200 - FLEXIBLE PAVING FOR DETAILED MATERIALS, AND EXECUTION REQUIREMENTS
- B. REFER TO CTDOT STANDARD SPECIFICATIONS FOR ROADS, HIGHWAYS AND BRIDGES 2016

PART 7 - VERTICAL GRANITE CURB (VGC) AND SITE CONCRETE

7.1 SCOPE OF WORK
- A. INSTALL VGC TO THE GRADES INDICATED ON THE PLANS WITHIN UNION PL IN ACCORDANCE WITH ALL APPLICABLE CITY OF HARTFORD DPW STANDARDS AND REQUIREMENTS.
- B. INSTALL (P) SIDEWALK CONCRETE AS INDICATED ON THE PLANS IN ACCORDANCE WITH ALL APPLICABLE CITY OF HARTFORD DPW STANDARDS AND REQUIREMENTS.
- C. INSTALL MISC. CONCRETE RELATED PRODUCTS AS INDICATED ON THE DRAWINGS

7.2 CONCRETE MIX PROPERTIES
- A. MIX

1. 5,000 PSI 28 DAY MINIMUM COMPRESSIVE STRENGTH
2. 0.40 MAXIMUM WATER TO CEMENT RATIO
3. ¾ IN. MAXIMUM SIZE AGGREGATE.
4. 6% +/- 1.5% AIR CONTENT
5. EXPOSURE CATEGORIES & CLASSES: F3, S0, W1, C2

- B. DENSITY

1. NORMAL WEIGHT DENSITY = 145 PCF

- C. CEMENTITIOUS MATERIALS

1. PORTLAND CEMENT: ASTM C150, TYPE II.
2. FLY ASH: ASTM C 618, CLASS F
3. SLAG CEMENT: ASTM C 989 GRADE 100 OR 120

- D. NORMAL-WEIGHT AGGREGATES: ASTM C 33, CLASS 4S COARSE AGGREGATE OR BETTER, GRADED. PROVIDE AGGREGATES FROM A SINGLE SOURCE WITH DOCUMENTED SERVICE RECORD DATA OF AT LEAST 10 YEARS' SATISFACTORY SERVICE IN SIMILAR APPLICATIONS AND SERVICE CONDITIONS USING SIMILAR AGGREGATES AND CEMENTITIOUS MATERIALS.
- E. AGGREGATE: FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT PER ASTM C33 (CLASS 4S)
- F. ADMIXTURES: CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES AND THAT DO NOT CONTRIBUTE WATER SOLUBLE CHLORIDE IONS EXCEEDING THOSE PERMITTED IN HARDENED CONCRETE. DO NOT USE CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE. SEE SPECIFICATION SECTION 03300-CIP CONCRETE FOR REQUIREMENTS
- G. WATER: ASTM C 94/C 94M AND POTABLE

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Waltham, MA 02451
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Greater Hartford Transit District

Consultant

ISSUED FOR BID

No.	Date	Description	By
B	05/09/2025	ISSUED FOR RE-BID	SPD
A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

CIVIL GENERAL NOTES (1 of 2)

Drawing Title

Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	N/A

STATE OF CONNECTICUT · SEAN P. DANIELSON · 50647 · LICENSED PROFESSIONAL ENGINEER

Seal

Drawing No.

C-0.0

8.5 CONCRETE PROTECTION 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 ACI 305.1 FOR HOT-WEATHER PROTECTION DURING CURING.

B. CURE CONCRETE ACCORDING TO ACI 308.1, BY ONE OR A COMBINATION OF THE FOLLOWING METHODS: MOISTURE RETAINING COVER AND/OR ABSORPTIVE COVER, WATER SATURATED, AND KEPT CONTINUOUSLY WET.

8.6 STANDARD SPECIFICATIONS AND REFERENCE STANDARDS

A. CRSI MANUAL OF STANDARD PRACTICE

B. ACI 318-14 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

C. FOLLOW THE LATEST RECOMMENDATIONS AND SPECIFICATIONS OF THE AMERICAN CONCRETE INSTITUTE:

1. ACI 301 SPECIFICATIONS FOR STRUCTURAL CONCRETE
2. ACI 302 CONCRETE FLOOR AND SLAB CONSTRUCTION
3. ACI 304 GUIDE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE
4. ACI 305 HOT WEATHER CONCRETING
5. ACI 306 COLD WEATHER CONCRETING
6. ACI 315 ACI DETAILING MANUAL
7. ACI 347 GUIDE TO FORMWORK FOR CONCRETE

PART 9 - MATERIALS AND PRODUCTS

ASPHALT BASE COURSE	SUPERPAVE S0.5 AS PER CTDOT STANDARD SPECS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION SECTION M.04. SUBMIT JOB-MIX FORMULA AND MANUFACTURER QUALIFICATIONS.
ASPHALT SURFACE COURSE	SUPERPAVE S1.0 PER CTDOT STANDARD SPECS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION SECTION M.04. SUBMIT JOB-MIX FORMULA AND MANUFACTURER QUALIFICATIONS.
ASPHALT SEALER	HOT APPLIED, SINGLE-COMPONENT JOINT SEALANT FOR ASPHALT COMPLY WITH ASTM D 6690, TYPES I, II, AND III.
GRAVEL BASE	PER CDOT M.02.01
CRUSHED STONE	PER CDOT M.01 NO.6. GRADATION, CTDOT FORM 817 AND SUBARTICLE M.02.02.2 (A) FOR LOSS ON ABRASION
SILT SOCK	SEDIMENT FILTER TUBE SHALL BE MULTI-FILAMENT, POLYPROPYLENE, W/ 100% STRENGTH FROM UV EXPOSURE AT 1000 HRS, MANUFACTURED BY FILTRESS, MVK SILT SOCK, GEI WORKS, OR APPROVED EQUAL.
SUITABLE BACKFILL	SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, AND SM ACCORDING TO ASTM D 2487, OR A COMBINATION OF THESE GROUPS; FREE OF ROCK OR GRAVEL LARGER THAN 3 IN. IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER. ONSITE MISCELLANEOUS FILL MAY BE USED AS BACKFILL UPON APPROVAL FROM ENGINEER OF RECORD.
TACK COAT	ASTM D977, TYPE RS-1.
PREFORMED JOINT FILLER	MEET REQUIREMENTS OF AASHTO M153.
HOT-POURED JOINT SEALER	HOT APPLIED SINGLE COMPONENT POLYMERIC JOINT SEALING COMPOUND PER ASTM D6690-21
CONCRETE GRADE RINGS	ASTM C478.
FILTER FABRIC	NON-WOVEN GEOTEXTILE MEETING THE REQUIREMENTS OF AASHTO M288-06 CLASS 2.
WARNING TAPE	ACID- AND ALKALI-RESISTANT, POLYETHYLENE FILM MANUFACTURED FOR MARKING AND IDENTIFYING UNDERGROUND UTILITIES, 6 IN. WIDE AND 4 MILS THICK. REFER TO SPECS FOR ADDITIONAL INFORMATION
CONCRETE MANHOLE	PRECAST CONCRETE PER ASTM C478. BUTYL RUBBER GASKETS PER ASTM C990.
FRAMES AND COVER	ASTM A48, CLASS 30B, HS-20-44 LOADING, 30" Ø UON.
PVC PIPE	PER REQUIREMENTS OF ASTM D3034, CLASS SDR 35
CLEANOUTS	CAST IRON FRAME AND COVER; ASTM A536, CAPABLE OF WITHSTANDING HS-20 TRAFFIC LOADS AT FINISHED GRADE. PROVIDE PVC RISER PIPE AND WYE BRANCH HS-20-44

*SUBMIT ALL PRODUCTS WHETHER SPECIFIED HEREIN OR NOT TO THE EOR FOR REVIEW AND APPROVAL.

ABBREVIATIONS:

APPROX.	APPROXIMATE
BC	BOTTOM OF CURB
BM	BENCH MARK
BOE	BOTTOM OF EXCAVATION
BOT	BOTTOM
BIT	BITUMINOUS
CL	CENTERLINE
CB	CATCH BASIN
CLR	CLEAR
CO	CLEANOUT
CTE	CONNECT TO EXISTING
DEP	DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIA	DIAMETER
DMH	DRAIN MANHOLE
DND	DO NOT DISTURB
DPW	DEPARTMENT OF PUBLIC WORKS
(E)	EXISTING
E	EASTING
E/S	EROSION AND SEDIMENTATION
EOR	ENGINEER OF RECORD
EL	ELEVATION
ELECT	ELECTRIC
ESMT	EASEMENT
EXC	EXCAVATION
FG	FINISHED GRADE
GS	GROUND SURFACE
GHTD	GREATER HARTFORD TRANSPORTATION DISTRICT
HMA	HOT MIX ASPHALT
INV	INVERT
LOE	LIMIT OF EXCAVATION
LOW	LIMIT OF WORK
LP	LIGHT POLE
MAX	MAXIMUM
MDC	METROPOLITAN DISTRICT COMMISSION HARTFORD, CONNECTICUT
ME	MATCH EXISTING
MIN	MINIMUM
MW	MONITORING WELL
MMH	MECHANICAL MANHOLE
NAD83	NORTH AMERICAN DATUM OF1983
NAVD88	NORTH AMERICAN VERTICAL DATUM 1988
N	NORTHING
NTS	NOT TO SCALE
(P)	PROPOSED
PCF	POUNDS PER CUBIC FOOT
PERF	PERFORATED
PL	PROPERTY LINE
PSF	POUNDS PER SQUARE FOOT
R	RADIUS
R&D	REMOVE AND DEMOLISH
R&S	REMOVE AND SALVAGE
RC	REINFORCED CONCRETE
ROW	RIGHT OF WAY
SIM.	SIMILAR
SOE	SUPPORT OF EXCAVATION
SF	SILT FENCE
SL HH	STREET LIGHTING HAND HOLE
SLCB	SITE LIGHTING CONTROL BOX
SMH	SEWER MANHOLE
SS	SEDIMENT FILTER TUBE
STA	STATION
TC	TOP OF CURB
TD	TERRACE DRAIN
TEMP	TEMPORARY
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VCC	VERTICAL CONCRETE CURB
VGC	VERTICAL GRANITE CURB
VIF	VERIFY IN FIELD

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Greater Hartford Transit District

Consultant

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B	05/09/2025	ISSUED FOR RE-BID	SPD
A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

CIVIL GENERAL NOTES (2 of 2)

Drawing Title

Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	N/A

STATE OF CONNECTICUT · SEAN P. DOOLON · 50647 · LICENSED PROFESSIONAL ENGINEER

Seal

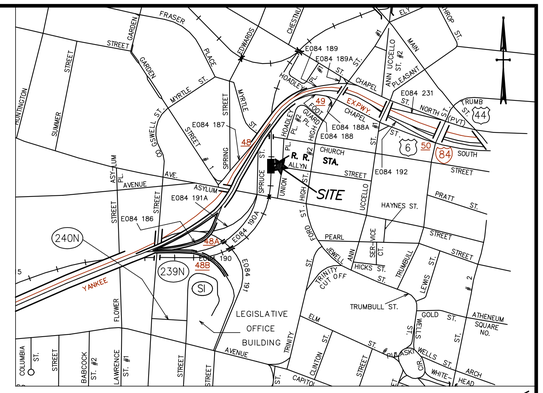
Drawing No.

C-0.1

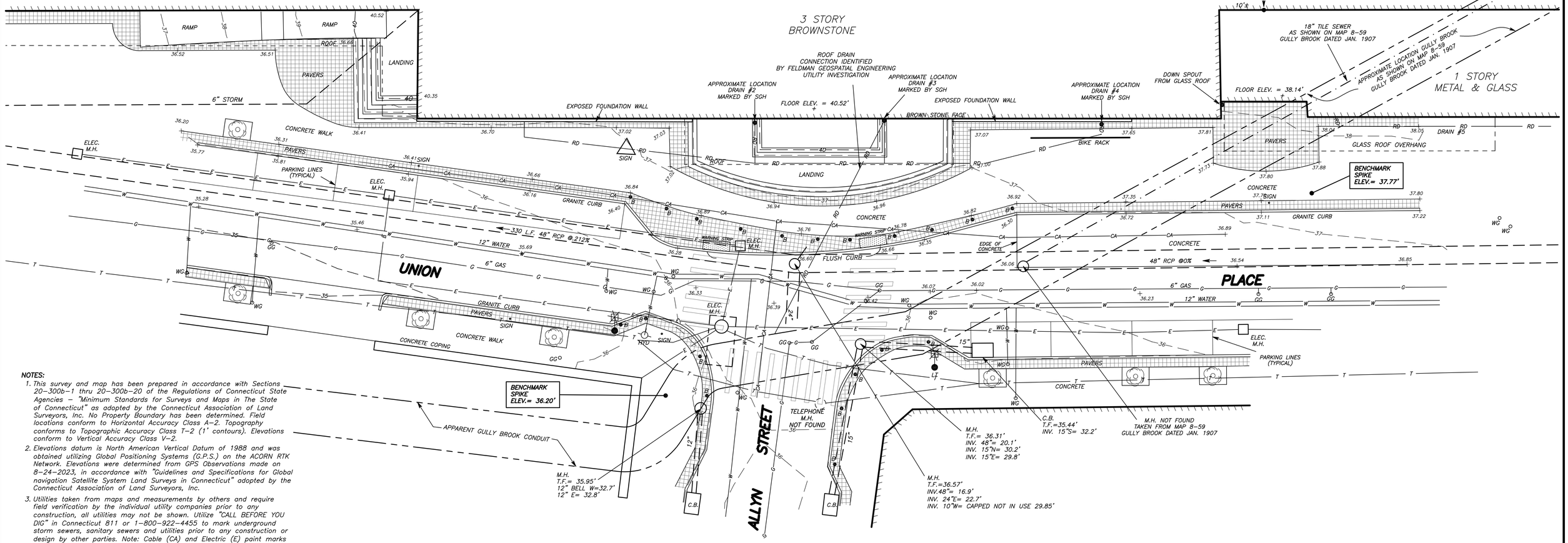


LEGEND

12"	PROPERTY LINE	WM	WATER METER
	STORM/SANITARY PIPE	WS	WATER SHUTOFF
E E	UNDERGROUND ELECTRIC	HYD	HYDRANT
CA CA	UNDERGROUND CABLE	CB	CATCH BASIN
W W	WATER LINE	M.H.	MANHOLE
G G	GAS LINE	LT	LIGHT
T T	TELEPHONE LINE	WG	WATER GATE
	CURB LINE	GG	GAS GATE
	EDGE OF PAVEMENT	B	BOLLARD
	EXISTING CONTOUR	SGH	SIMPSON GUMPERTZ & HEGER
		36.84	SPOT ELEVATION
	BUILDING FACE	RD RD	ROOF DRAIN



VICINITY MAP
SCALE: 1"= 800'



NOTES:

1. This survey and map has been prepared in accordance with Sections 20–300b–1 thru 20–300b–20 of the Regulations of Connecticut State Agencies – "Minimum Standards for Surveys and Maps in The State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. No Property Boundary has been determined. Field locations conform to Horizontal Accuracy Class A–2. Topography conforms to Topographic Accuracy Class T–2 (1' contours). Elevations conform to Vertical Accuracy Class V–2.
2. Elevations datum is North American Vertical Datum of 1988 and was obtained utilizing Global Positioning Systems (G.P.S.) on the ACORN RTK Network. Elevations were determined from GPS Observations made on 8–24–2023, in accordance with "Guidelines and Specifications for Global navigation Satellite System Land Surveys in Connecticut" adopted by the Connecticut Association of Land Surveyors, Inc.
3. Utilities taken from maps and measurements by others and require field verification by the individual utility companies prior to any construction, all utilities may not be shown. Utilize "CALL BEFORE YOU DIG" in Connecticut 811 or 1–800–922–4455 to mark underground storm sewers, sanitary sewers and utilities prior to any construction or design by other parties. Note: Cable (CA) and Electric (E) paint marks were located and incorporated with existing mapping.

PARTICULAR REFERENCED UTILITY MAPS

Gully Brook Conduit Plan dated Jan 1907 by the Army Corps of Engineers sheet 8–59.

Union Place City of Hartford Public Works Existing Conditions Project No. CT–79–X002 Sheet No. EC–01 dated 12/23/2013.

Sewer in Union Place Dept. of Engineering, Hartford, Conn. sheet 1 of 2 sheets Dated Dec 1943.

City of Hartford Department of Public Works Drainage and Utility Plans sheet DRN–01 dated 12/23/13

Utilities investigation by Feldman Geospatial Engineering on or about 10–19–2023.

To my knowledge and belief,
this map is substantially correct as noted hereon.

TRACY H. LEWIS L.L.S. CT. LIC. NO. 15160

This map is not valid unless it has a live signature and embossed seal of Tracy H. Lewis.

REVISIONS		
NO.	DATE	DESCRIPTION
1.	10-24-2023	UTILITY LOCATIONS
2.	10-30-2023	SGH COMMENTS

TOPOGRAPHIC SURVEY

HARTFORD UNION STATION

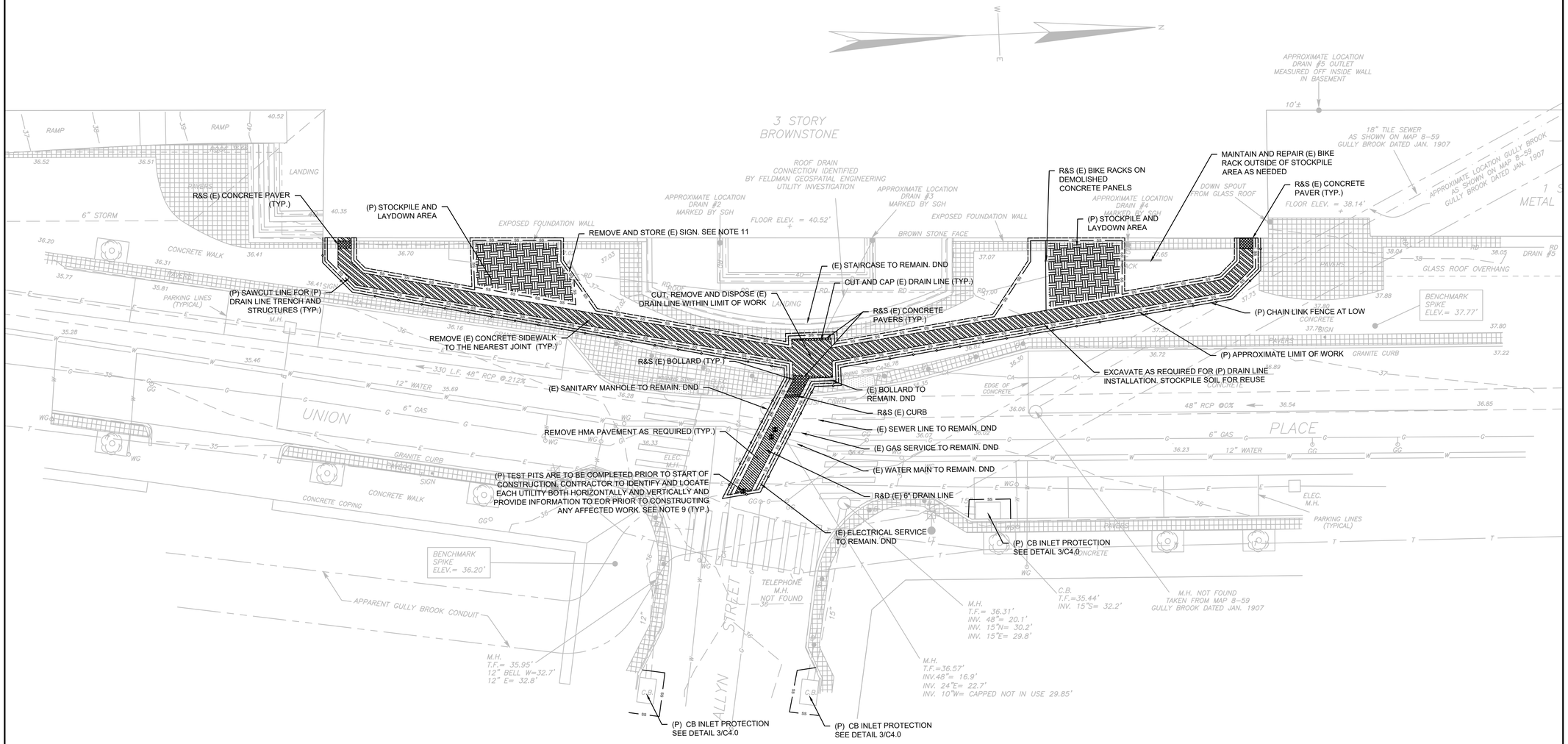
LOCATED AT
1 UNION PLACE
HARTFORD, CONNECTICUT
PREPARED FOR

SIMPSON GUMPERTZ & HEGER

Lewis Associates
Land Surveying and Civil Engineering
260 Main Street – Monroe, CT 06468
Phone: 203–261–8648 Fax: 203–261–8658

DATE: 8-24-2023
SCALE: 1" = 10'
FILE: 2023-069
SHEET NO: 1 of 1

L:_CARLSON PROJECTS\2023-069C-SGH UNION PL HARTFORD\DWGS\BASE MAP.dwg



LEGEND

- (P) TEMPORARY CHAIN LINK FENCE
- (P) APPROXIMATE LIMIT OF WORK
- (P) SILT SOCK
- (P) SAWCUT LINE
- R&D (E) CONCRETE OR BRICK SIDEWALK
- R&S (E) CONCRETE PAVERS
- R&D HMA FULL DEPTH
- R&S (E) EXISTING CURB
- LAYDOWN AREA
- (P) CB INLET PROTECTION
- TEST PIT LOCATIONS

NOTES:

1. SUBSURFACE UTILITY ENGINEERING (SUE) IS BASED ON DRAFT SURVEY PREPARED BY FELDMAN GEOSPATIAL TITLED "2301083.PDF", DATED 20 OCT 2023.
2. EXISTING CONDITIONS INFORMATION IS BASED ON A DRAFT SURVEY PREPARED BY LEWIS ASSOCIATES TITLED "TOPOGRAPHIC SURVEY - HARTFORD UNION STATION", RECEIVED 30 OCT 2023.
3. LOCATION OF UTILITIES IS SHOWN FOR REFERENCE ONLY AND WILL REQUIRE VERIFICATION IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE EOR OF ADDITIONAL SUBSURFACE UTILITIES NOT SHOWN HEREIN THAT AFFECT THE DEMOLITION SCOPE OF WORK PRIOR TO UNDERTAKING AFFECTED WORK. THE CONTRACTOR SHALL ESTABLISH AN APPROPRIATE COST AND SCHEDULE CONTINGENCY TO ACCOUNT FOR COORDINATION AND REMOVAL OF ADDITIONAL ABANDONED UTILITIES NOT SHOWN HEREIN.
4. ALL EXISTING UTILITY MAINS ARE TO REMAIN AND NOT BE DISTURBED. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY UTILITY SUPPORT AS NEEDED.
5. CONTRACTOR TO COORDINATE UTILITY CAPPING AND ABANDONMENT WITH NEIGHBORING PROPERTY AS NEEDED TO ENSURE SERVICE IS NOT DISRUPTED.
6. NEIGHBORING PROPERTY IS NOT TO BE DISTURBED DURING CONSTRUCTION. DAMAGE DONE TO NEIGHBORING PROPERTY DURING CONSTRUCTION IS TO BE REPLACED AT NO ADDITIONAL COST TO THE OWNER OR ENGINEER OF RECORD.
7. CONTRACTOR TO PROVIDE SILT SACK IN CATCH BASINS AND SURFACE DRAINS UPSTREAM AND DOWNSTREAM OF THE PROPOSED CONSTRUCTION ON UNION PLACE.
8. ALL EXISTING MANHOLES, VALVE BOXES, HYDRANTS, SIGNAGE, MAILBOXES, LIGHT POLES, AND ANY OTHER INFRASTRUCTURE NOT LISTED HEREIN WITHIN UNION PLACE AND ALLYN STREET ARE TO REMAIN AND ARE NOT TO BE DISTURBED DURING CONSTRUCTION. DAMAGE TO ANY EXISTING INFRASTRUCTURE SHALL BE FIXED SOLELY AT THE CONTRACTORS EXPENSE.
9. CONTRACTOR TO PERFORM SUE (LEVEL A PER ASCE) TO IDENTIFY UTILITIES WITHIN THE AREA OF PROPOSED DRAINAGE LINE INSTALLATION. CONTRACTOR TO PERFORM TEST PITTING OPERATION TO LOCATE ALL UTILITY CROSSINGS FOR PROPOSED SERVICE LATERALS PROVIDE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AT CROSSINGS WITH PROPOSED DRAINAGE LINE AND PROVIDE RESULTS OF SUE AND TEST PITTING OPERATION DATA TO EOR PRIOR TO UNDERTAKING AFFECTED WORK. CONTRACTOR TO IDENTIFY POTENTIAL UTILITY CONFLICTS WITH PROPOSED DRAINAGE LINE BASED ON FIELD VERIFICATION OF EXISTING UTILITIES AND PROVIDE A SKETCH OF CLEARANCES FROM PROPOSED DRAINAGE LINE TO EXISTING UTILITIES TO THE EOR FOR REVIEW AND APPROVAL PRIOR TO UNDERTAKING AFFECTED WORK.
10. FULL LIMIT OF WORK IS SHOWN. CONTRACTOR TO PHASE PROJECT SUCH THAT ONE SIDE OF THE STAIR CASE IS OPEN AT ALL TIMES TO MAINTAIN PEDESTRIAN ACCESS. IN ADDITION, CONTRACTOR TO MAINTAIN DETOURS ON SIDE WHERE ACTIVE CONSTRUCTION. COORDINATE DETOUR WITH OWNER AND CITY. ADJUST TEMPORARY CHAIN LINK FENCE ACCORDINGLY. CONTRACTOR TO SUBMIT PHASING PLAN FOR PHASES OF WORK AND DETOURS (VEHICULAR AND PEDESTRIAN) REQUIRED. THE DISTRICT WILL COORDINATE WITH CTTRANSIT, A/E FIRM, AND CONTRACTOR FOR PUBLIC BUS ROUTE DETOURS.
11. CONTRACTOR TO REMOVE SIGN. OWNER (GHTD) TO STORE.
12. SIDEWALKS ARE NOT CONSIDERED HISTORIC. ONLY THE UNION STATION BUILDING IS CONSIDERED HISTORIC.

0 10 20 30 40

SCALE: 1" = 10'

SIMPSON GUMPERTZ & HEGER
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Greater Hartford Transit District

Consultant

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No.	Date	Description	By
B	05/09/2025	ISSUED FOR RE-BID	SPD
A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

SITE PREP, DEMO & E/S CONTROL PLAN

Drawing Title

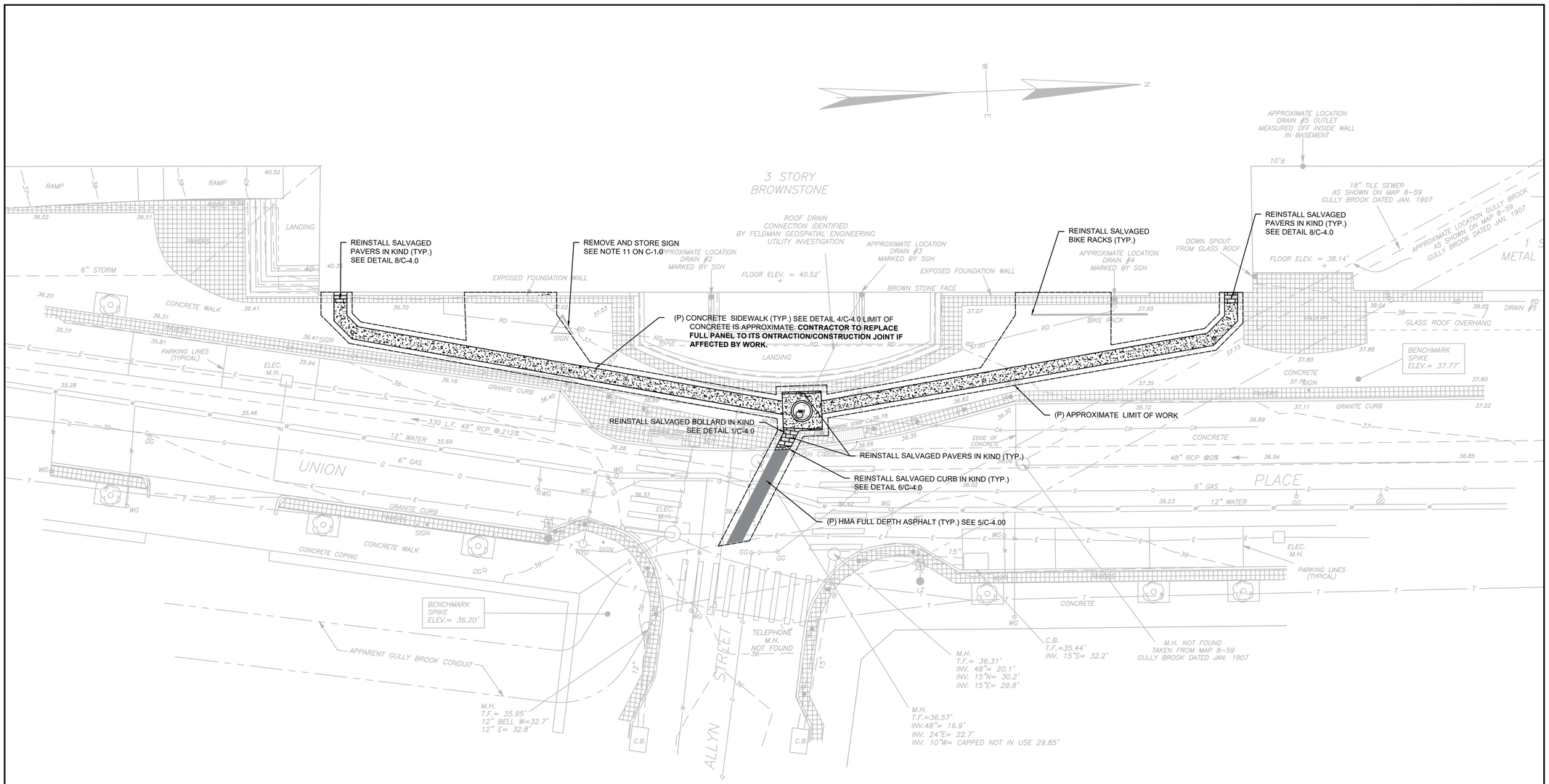
Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	1"-10'

STATE OF CONNECTICUT SEAN P. DOOLOW 30647 LICENSED PROFESSIONAL ENGINEER

Seal

Drawing No.

C-1.0



LEGEND

- (P) APPROXIMATE LIMIT OF WORK
- (P) CONCRETE
- (P) FULL DEPTH ASPHALT
- (P) VERTICAL GRANITE CURB
- (P) REINSTALL SALVAGED PAVERS

NOTES:

1. SUBSURFACE UTILITY ENGINEERING IS BASED ON DRAFT SURVEY PREPARED BY FELDMAN GEOSPATIAL TITLED "2301083.PDF", RECEIVED 20 OCT 2023.
2. EXISTING CONDITIONS INFORMATION IS BASED ON A DRAFT SURVEY PREPARED BY LEWIS ASSOCIATES TITLED "TOPOGRAPHIC SURVEY - HARTFORD UNION STATION", RECEIVED 30 OCT 2023.
3. LOCATION OF UTILITIES IS SHOWN FOR REFERENCE ONLY AND WILL REQUIRE VERIFICATION IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. ALL PAVEMENT REPLACEMENT WILL BE IN ACCORDANCE WITH THE CITY OF HARTFORD DEPARTMENT OF PUBLIC WORKS STANDARDS AND SPECIFICATIONS. THE PROPOSED PAVEMENT SECTION IS TO MATCH EXISTING OR MEET ALL APPLICABLE REQUIREMENTS, WHICHEVER IS MORE STRINGENT. CONTRACTOR TO SUBMIT SKETCH OF EXISTING SECTION AND PROPOSED SECTION TO EOR FOR REVIEW AND APPROVAL PRIOR TO UNDERTAKING AFFECTED WORK. CONTRACTOR IS TO MATCH EXISTING GRADES AND PREPARE SKETCH AND SUBMIT TO EOR FOR REVIEW AND APPROVAL PRIOR TO UNDERTAKING AFFECTED WORK.
5. ALL EXISTING UTILITY MAINS ARE TO REMAIN AND NOT BE DISTURBED. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY UTILITY SUPPORT AS NEEDED.
6. VERTICAL GRANITE CURBING SECTIONS REQUIRED TO BE RESET OR RECONSTRUCTED ARE TO MATCH EXISTING SECTION OR RECONSTRUCTED TO THE MOST RECENT DPW DETAIL, WHICHEVER IS MORE STRINGENT.
7. EOR TO PROVIDE CAD FILE TO CONTRACTOR PRIOR TO CONSTRUCTION TO FACILITATE (P) IMPROVEMENTS LAYOUT IN THE FIELD.

0 10 20 30 40

SCALE: 1" = 10'

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sgh.com

Greater Hartford Transit District

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A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

SITE PLAN

Drawing Title

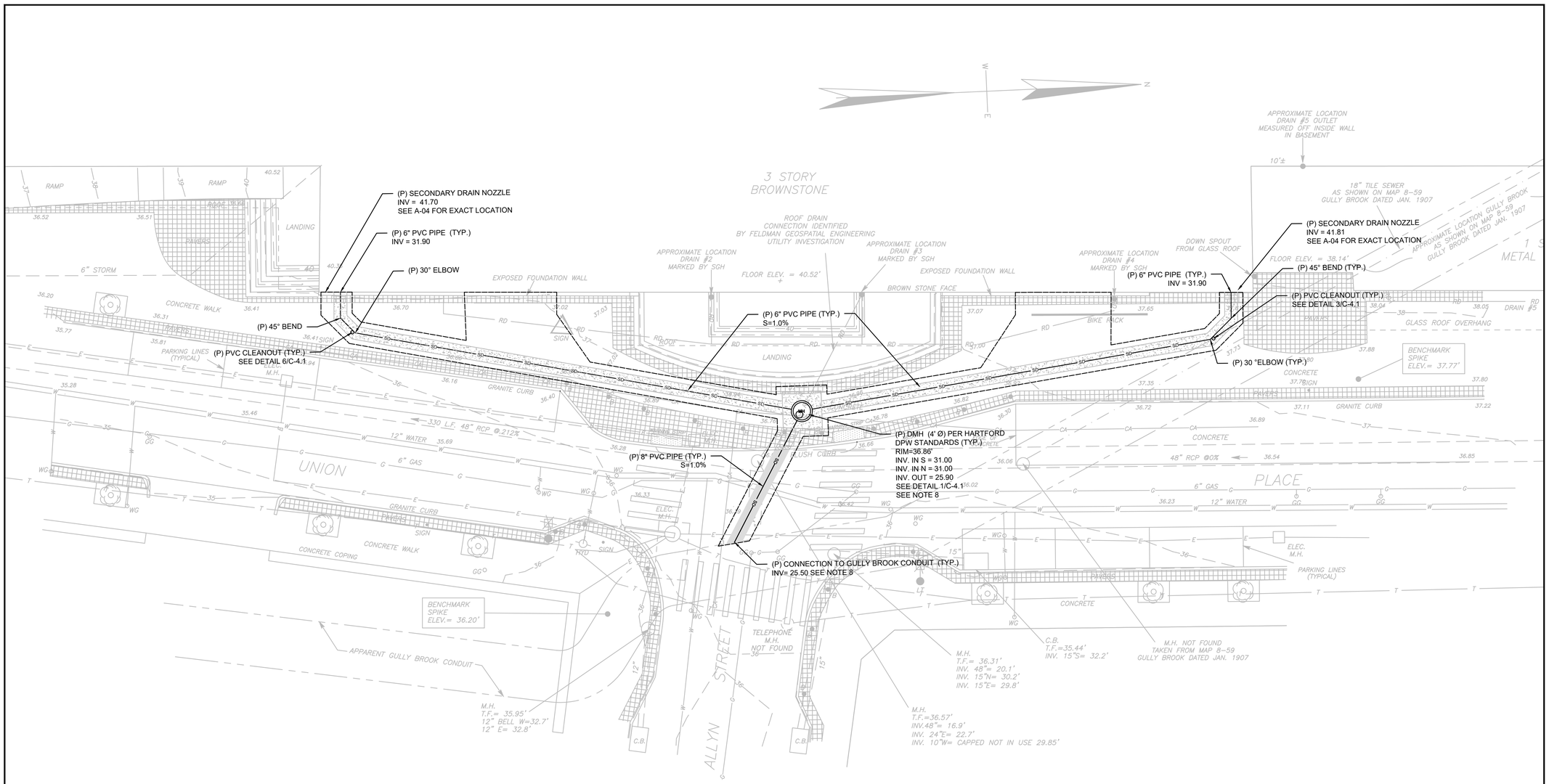
Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	1"-10'

STATE OF CONNECTICUT · SEAN P. DONLON · 50647 · LICENSED PROFESSIONAL ENGINEER

Seal

Drawing No.

C-2.0



LEGEND

- (P) APPROXIMATE LIMIT OF WORK
- SD (P) PVC PIPE
- (P) DRAINAGE MANHOLE
- (P) PVC CLEANOUT

NOTES:

1. SUBSURFACE UTILITY ENGINEERING IS BASED ON DRAFT SURVEY PREPARED BY FELDMAN GEOSPATIAL TITLED "2301083.PDF", RECEIVED 20 OCT 2023.
2. EXISTING CONDITIONS INFORMATION IS BASED ON A DRAFT SURVEY PREPARED BY LEWIS ASSOCIATES TITLED "TOPOGRAPHIC SURVEY - HARTFORD UNION STATION", RECEIVED 30 OCT 2023.
3. CONTRACTOR TO PERFORM SUBSURFACE UTILITY ENGINEERING (SUE) TO IDENTIFY EXISTING UTILITIES WITHIN THE AREA OF PROPOSED UTILITY SERVICES. CONTRACTOR TO PERFORM TEST PITTING OPERATION TO LOCATE ALL UTILITY CROSSINGS FOR PROPOSED SERVICE LATERALS. PROVIDE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AT CROSSINGS WITH PROPOSED SERVICES AND PROVIDE RESULT OF SUE AND TEST PITTING OPERATION DATA TO EOR PRIOR TO UNDERTAKING AFFECTED WORK. CONTRACTOR TO IDENTIFY POTENTIAL UTILITY CONFLICTS WITH PROPOSED SERVICES BASED ON FIELD VERIFICATION OF EXISTING UTILITIES AND PROVIDE A SKETCH OF CLEARANCES FROM PROPOSED SERVICES TO EXISTING UTILITIES TO THE EOR FOR REVIEW AND APPROVAL PRIOR TO UNDERTAKING AFFECTED WORK.
4. ALL DRAINAGE SERVICE PIPES ARE UNDER THE DIRECTION OF THE PLUMBING ENGINEER TO A DIMENSION OF 10' BEYOND THE EXTERIOR BUILDING WALL. PIPING BEYOND 10' OF THE EXTERIOR WALLS ARE UNDER THE DIRECTION OF THE CIVIL ENGINEER.
5. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT GRADING MEETS ALL APPLICABLE ADA REQUIREMENTS. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE SLOPES ARE PROVIDED AND PROVIDE EOR A FINAL AS-BUILT PLAN WITH FINAL FINISHED GRADES FOR REVIEW AND APPROVAL. THE CONTRACTOR IS RESPONSIBLE TO REMOVE AND REPLACE ANY NON ADA COMPLIANT WORK AT NO ADDITIONAL EXPENSE TO THE OWNER OR EOR.
6. EOR TO PROVIDE CAD FILE TO CONTRACTOR PRIOR TO CONSTRUCTION TO FACILITATE (P) IMPROVEMENTS LAYOUT IN THE FIELD.
7. CONTRACTOR TO MATCH ALL EXISTING FINISH GRADE ELEVATIONS UNLESS OTHERWISE NOTED.
8. EOR TO FINALIZE PIPE INVERT DESIGN UPON RECEIPT OF THE SUBSURFACE UTILITY ENGINEERING AND TEST PIT INFORMATION COLLECTED BY THE CONTRACTOR. REFER TO DRAWING C-1.00 FOR ADDITIONAL INFORMATION

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ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

GRADING AND DRAINAGE PLAN

Drawing Title

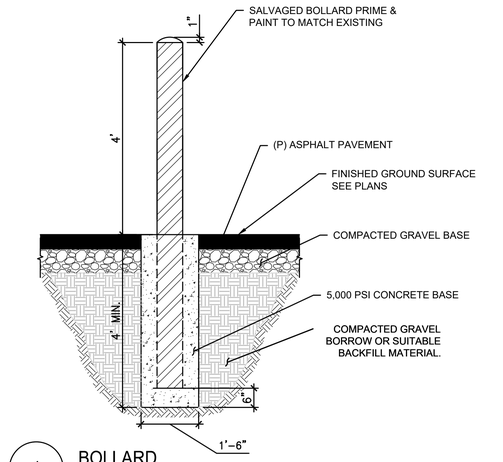
Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	1"-10'

STATE OF CONNECTICUT · SEAN P. DONLON · 50647 · LICENSED PROFESSIONAL ENGINEER

Seal

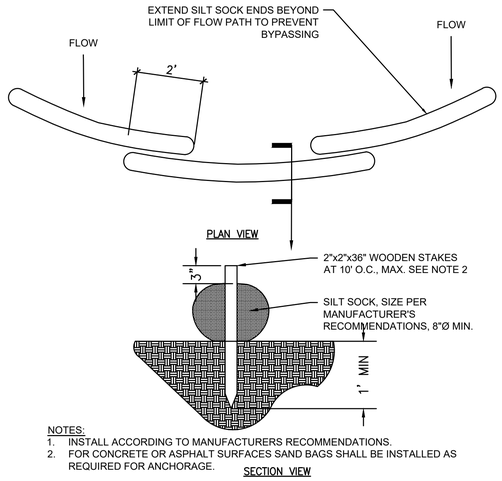
Drawing No.

C-3.0



1 BOLLARD

NTS

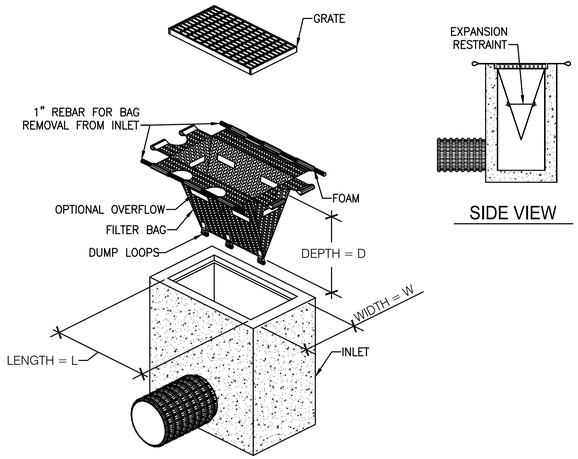


NOTES:
1. INSTALL ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
2. FOR CONCRETE OR ASPHALT SURFACES SAND BAGS SHALL BE INSTALLED AS REQUIRED FOR ANCHORAGE.

SECTION VIEW

2 SILT SOCK

NTS



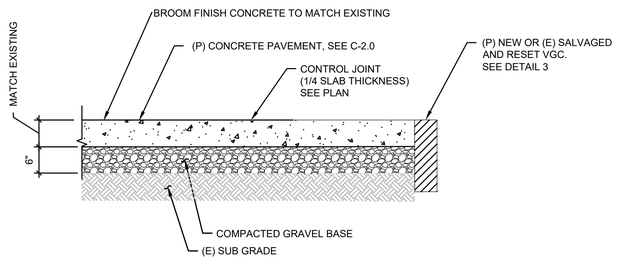
SIDE VIEW

INLET PROTECTION NOTES:

A. INSTALLATION: THE CATCH BASIN FILTER PRODUCT SHOULD BE PLACED UNDER THE GRATE. INSTALL FOAM BLOCK TO BLOCK CURB INLET OPENING IF APPLICABLE. FOLLOW ALL MANUFACTURES RECOMMENDATIONS FOR INSTALLATION AND REMOVAL.
B. MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM SURFACE AND VICINITY OF UNIT AFTER EACH STORM EVENT. REMOVE SEDIMENT THAT HAS ACCUMULATED WITHIN THE CONTAINMENT AREA AS NEEDED. IF USING OPTIONAL OIL ABSORBENTS; REMOVE AND REPLACE ABSORBENT PILLOW WHEN NEAR SATURATION.
C. SUBSTITUTIONS WILL BE ALLOWED ONLY UPON APPROVAL BY THE ENGINEER.

3 CATCH BASIN INLET PROTECTION

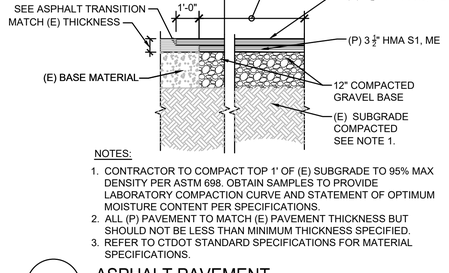
NTS



NOTES:
1. SEE PLANS FOR (P) CONCRETE SIDEWALK LIMITS.
2. SAWCUT CONTROL JOINTS TO 1/4 OF SLAB THICKNESS AT 5'-0" ± O.C. OR AS INDICATED ON PLANS.
3. ½" PRE-FORMED EXPANSION JOINT SHALL BE INSTALLED PER ASTM D1751 AT ALL INTERSECTIONS OF BUILDING, WALKS, UTILITY PENETRATIONS, AND ANY OTHER FIXED STRUCTURES. PROVIDE JOINT SEALANT AT EXPANSION/ISOLATION JOINTS.
4. PLACE PRE-FORMED ⅜" THICK FOAM EXPANSION JOINT AT 30' O.C. PERPENDICULAR TO CURB ALIGNMENT EXTENDING THROUGH THE SIDEWALK DEPTH.
5. PRE-FORMED ¾" THICK EXPANSION JOINTS SHALL BE USED AT THE TRANSITION BETWEEN PROPOSED CONCRETE AND EXISTING CONCRETE.
6. REFER TO HARTFORD MDC STANDARD CONSTRUCTION SPECIFICATIONS FOR MATERIAL SPECIFICATIONS.

4 SIDEWALK RESTORATION

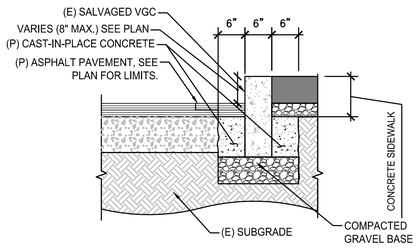
NTS



NOTES:
1. CONTRACTOR TO COMPACT TOP 1' OF (E) SUBGRADE TO 95% MAX DENSITY PER ASTM 698. OBTAIN SAMPLES TO PROVIDE LABORATORY COMPACTION CURVE AND STATEMENT OF OPTIMUM MOISTURE CONTENT PER SPECIFICATIONS.
2. ALL (P) PAVEMENT TO MATCH (E) PAVEMENT THICKNESS BUT SHOULD NOT BE LESS THAN MINIMUM THICKNESS SPECIFIED.
3. REFER TO CTDOT STANDARD SPECIFICATIONS FOR MATERIAL SPECIFICATIONS.

5 ASPHALT PAVEMENT

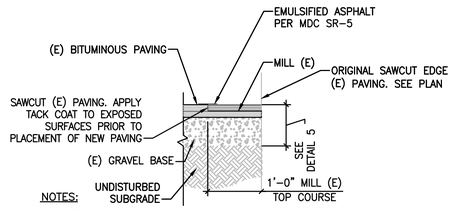
NTS



NOTES:
1. REFER TO HARTFORD MDC STANDARD DETAILS, WHICHEVER IS MORE STRINGENT SHALL APPLY.

6 VERTICAL GRANITE CURB

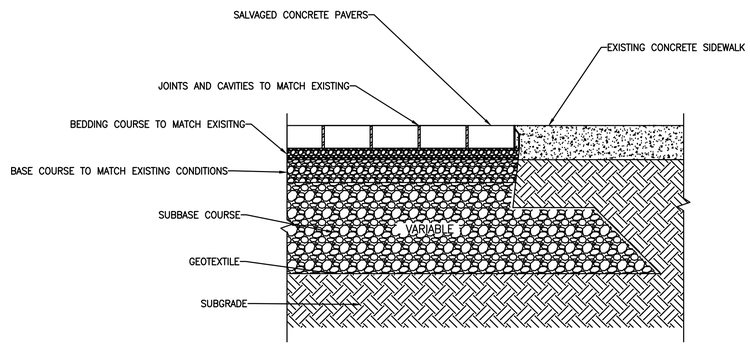
NTS



NOTES:
1. EXISTING, ADJOINING PAVEMENT SHALL BE DRY AND FREE OF DEBRIS.
2. REFER TO HARTFORD MDC CONSTRUCTION SPECIFICATIONS FOR MATERIAL SPECIFICATIONS.

7 ASPHALT TRANSITION

NTS



8 CONCRETE PAVERS

N.T.S.

SIMPSON GUMPERTZ & HEGER
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Greater Hartford Transit District

Consultant

ISSUED FOR BID

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B	05/09/2025	ISSUED FOR RE-BID	SPD
A	03/04/2025	ISSUED FOR BID	SPD

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

SITE DETAILS (1 OF 2)

Drawing Title

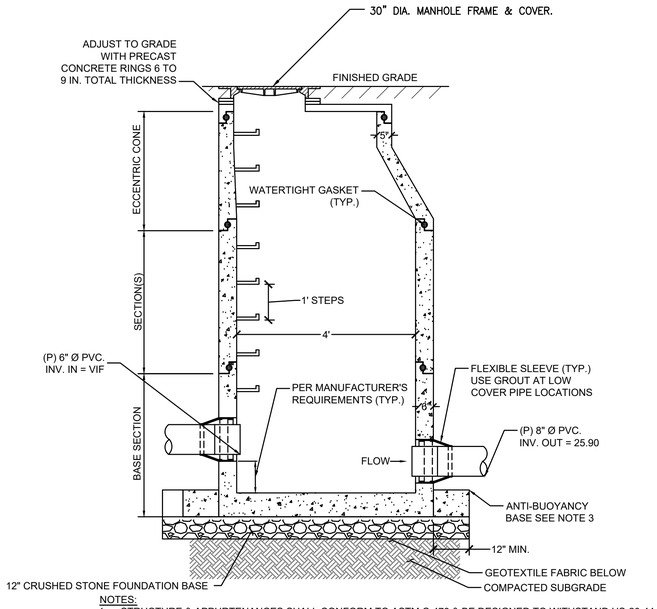
Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn	Approved	Scale
FYY	SPD	NTS

STATE OF CONNECTICUT SEAN P. DONEGAN 30647 LICENSED PROFESSIONAL ENGINEER

Seal

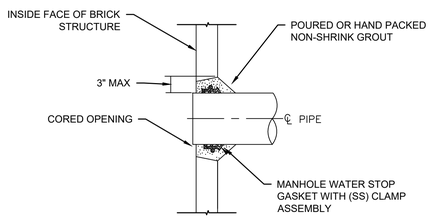
Drawing No.

C-4.0



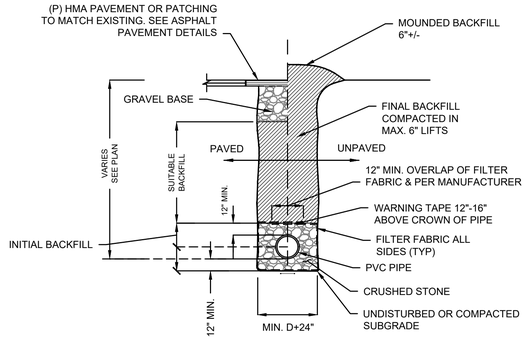
NOTES:
1. STRUCTURE & APPURTENANCES SHALL CONFORM TO ASTM C-478 & BE DESIGNED TO WITHSTAND HS-20-44 LOADING.
2. STRUCTURE SHALL BE DESIGNED TO RESIST BUOYANCY WITH A FOS=2.00.
3. CONTRACTOR TO SUBMIT SHOP DRAWINGS & BUOYANCY CALCULATIONS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF CT TO EOR FOR REVIEW AND APPROVAL PRIOR TO PROCUREMENT AND CONSTRUCTION.
4. INVERT THROUGH THE MANHOLE SHALL HAVE A UNIFORM GRADE OF MINIMUM 0.10 FEET BETWEEN THE INVERTS OF THE INLET AND OUTLET PIPES. INVERTS SHALL BE FIELD FORMED AND NOT FORMED IN SHOP/YARD.
5. DISTANCE FROM TOP OF MANHOLE COVER TO FIRST PLASTIC STEP SHALL BE BETWEEN 12" AND 16".
6. MANHOLE COVER TO BE IN CONFORMANCE TO HARTFORD STANDARDS.

1 PRECAST CONC. DRAIN MANHOLE
NTS



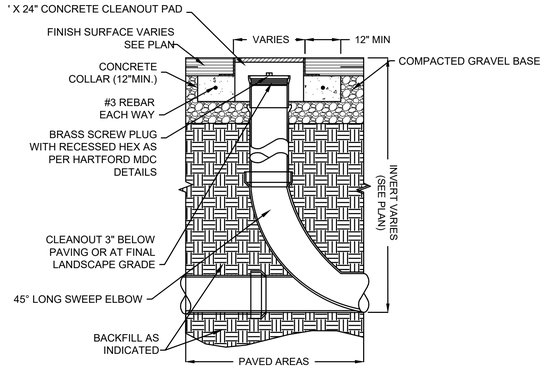
NOTES:
1. REFER TO OTHER PIPE CONNECTION DETAILS PROVIDED BY HARTFORD MDC FOR OTHER APPROVED CONNECTION METHODS.
2. CONNECTION POINT TO GULLY BROOK CONDUIT'S BRICK STRUCTURE MAY BE FROM THE TOP RATHER THAN THE SIDE. CONTRACTOR TO VERIFY IN FIELD.

4 PIPE CONNECTION TO EXISTING BRICK STRUCTURE
NTS



NOTES:
1. ALL BACKFILL MATERIAL TO BE PLACED IN MAXIMUM OF 6" LIFTS UON WITHIN 2% OF OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY PER ASTM D 698 BEFORE PLACING NEXT LIFT. ALL FILL PLACED BELOW PIPES AND STRUCTURES SHALL MEET THIS REQUIREMENT.
2. ALL TRENCHES TO BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE HARTFORD MDC STANDARDS AND REQUIREMENTS. APPLY THE MORE STRINGENT REQUIREMENTS.
3. MINIMUM COVER FOR PVC PIPE TO MEET HARTFORD MDC STANDARDS.

2 TYPICAL TRENCH INSTALLATION (PVC PIPE)
NTS



3 PIPE CLEANOUT
NTS

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Greater Hartford Transit District

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ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

SITE DETAILS (2 OF 2)

Drawing Title

Project No.	Checked	Date
230979.00	EDD	05/09/2025
Drawn: FYY	Approved: SPD	Scale: NTS

STATE OF CONNECTICUT · SEAN P. DONLON · 50647 · LICENSED PROFESSIONAL ENGINEER

Seal

Drawing No.

C-4.1

DRAIN SCHEDULE

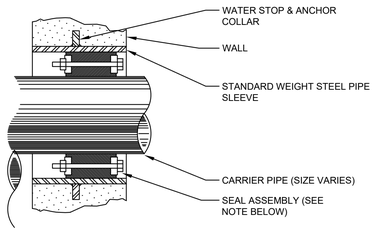
DESIGNATION	DESCRIPTION	AREA/LOCATION	MANUFACTURER	MODEL	COMMENTS / DESCRIPTION
RD-1 & OFD-1	ROOF DRAIN & OFERFLOW	SEE DRAWINGS	ZURN, JOSAM OR JAY R. SMITH	Z164-NH-AR-E	ACID RESISTANT COATING, NO HUB OUTLET,12" DIAMETER, STATIC EXTENSION, 90 DEGREE TURN AND TOP SET DECK PLATE. OFD-1 SET 2" ABOVE RD-1.
GD-1	GUTTER DRAIN	SEE DRAWINGS	JOSAM	24704	4" COATED CAST IRON PARAPET TYPE ROOF DRAIN, REMOVABLE SLOPING BRONZE GRATE, FLASHING CLAMP, SHALLOW SUMP WITH FLASHING FLANGE AND SIDE OUTLET
DN-1	DOWN SPOUT NOZZLE	SEE DRAWINGS	ZURN, JOSAM OR JAY R. SMITH	Z-199-NH-ZANB	NICKEL BRONZE WITH NO-HUB CORRECTION

GENERAL NOTES

1. CONTRACTOR SHALL REFER TO THE PLUMBING SPECIFICATIONS ON THIS DRAWING.
2. NEW WORK DRAWN HEAVILY.
3. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO ALL PLUMBING DRAWINGS.
4. DRAWINGS ARE DIAGRAMMATIC: DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
5. ALL PLUMBING WORK SHALL BE IN ACCORDANCE WITH THE CONNECTICUT STATE PLUMBING CODE. THE CONNECTICUT STATE BUILDING CODE AND THE DRAWINGS. NO WORK SHALL BE INSTALLED IN VIOLATION OF ANY GOVERNING CODES. ANY WORK SHOWN ON THE DRAWINGS WHICH IS IN VIOLATION OF SUCH CODES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND THE OWNER'S REPRESENTATIVE AND SHALL BE RESOLVED PRIOR TO THE INSTALLATION OF THE WORK INVOLVED.
6. ALL PRODUCT INSTALLATIONS SHALL ADHERE TO MANUFACTURERS' RECOMMENDATIONS.
7. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
8. PRIOR TO THE START OF CORING ANY STRUCTURAL MEMBER PLUMBING SUBCONTRACTOR SHALL COORDINATE LOCATION OF PENETRATION WITH STRUCTURAL ENGINEER AND GENERAL CONTRACTOR. PLUMBING SUBCONTRACTOR SHALL PREPARE AND SUBMIT TO STRUCTURAL ENGINEER AND ARCHITECT A SET OF PENETRATION DRAWINGS DURING COORDINATION DRAWING REVIEW PERIOD. PLUMBING SUBCONTRACTOR MAY DEVIATE FROM LOCATIONS OF PENETRATIONS AS SHOWN ON PLUMBING DRAWINGS BUT MUST COORDINATE ALTERNATIVE LOCATIONS WITH STRUCTURAL ENGINEER.
9. PRIOR TO START OF INSTALLATION OF BELOW SLAB PIPING, PLUMBING SUBCONTRACTOR SHALL COORDINATE LOCATIONS OF PIPING WITH STRUCTURAL FOOTINGS, GRADE BEAMS, ETC. WITH STRUCTURAL ENGINEER.
10. PRIOR TO INSTALLATION OF UNDER SLAB PIPING AT GROUND FLOOR, PLUMBING SUBCONTRACTOR SHALL COORDINATE ALL EXTERIOR INVERT ELEVATIONS WITH CIVIL ENGINEER.
11. PRIOR TO THE START OF WORK THE PLUMBING SUBCONTRACTOR SHALL COORDINATE ALL STACK LOCATIONS WITH ARCHITECT AND CONSTRUCTION MANAGER TO AVOID STRUCTURAL AND PARTITION CONFLICTS.
12. ALL STORM STACKS SHALL HAVE A CLEAN OUT AT THEIR BASE
13. THESE DOCUMENTS DESCRIBE THE SYSTEMS REQUIRED AND APPROXIMATELY WHERE THE LARGER EQUIPMENT IS TO BE LOCATED. THIS SUBCONTRACTOR SHALL INCLUDE ALLOWANCES IN ESTIMATES TO FULLY COMPLETE THE SYSTEM INCLUDING ALL INTERCONNECTING AND COORDINATION AND INSTALLATION DETAILS AND COMPONENTS AND EXTENDING THE SYSTEM INTO AND THROUGHOUT ALL SPACES. INCLUDE ALLOWANCES FOR START UP AND FOR MAKING THE SYSTEMS FULLY OPERATIONAL, AND FOR SCOPE AND DESIGN CONTINGENCIES. FUTURE CHANGES IN PRICE ABOVE THE CD, FOR ITEMS NOT SHOWN ON THESE DRAWINGS WILL NOT BE ALLOWED IF THE SYSTEM ITSELF IS SHOWN OR DESCRIBED IN THESE DOCUMENTS.
14. CONTRACTOR SHALL USE VERSION OF THE IPC THAT THE CONNECTICUT BUILDING CODE OUTLINES.

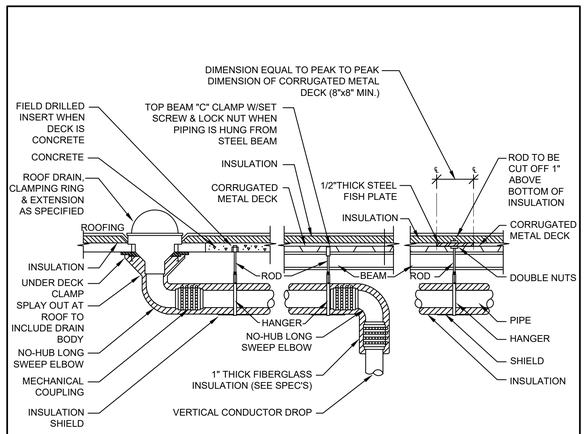
LEGEND

SYMBOL	ABBR.	DESCRIPTION
	ETR	EXISTING TO REMAIN
	ETBR	EXISTING TO BE REMOVED
		LOCATED ON FLOOR BELOW
ST	ST	STORM PIPING
OFD	OFD	OVERFLOW DRAINAGE PIPING
	RD	ROOF DRAIN
	CTE	PIPE CONNECT TO EXISTING
		PIPE RISER
		PIPE CONTINUATION
		PIPE UP THROUGH SLAB ABOVE
		PIPE DOWN THROUGH FLOOR SHOWN
	DCO	DANDY CLEANOUT
	CO	CLEANOUT
	FCO	FLUSH FLOOR CLEANOUT
	VIF	VERIFY IN FIELD
	RTTP	REMOVE TO THIS POINT
	DS	DOWNSPOUT
	DN	DOWN
	SQ FT	SQUARE FEET



NOTES:
SEAL ASSEMBLY SHALL BE MODULAR MECHANICAL TYPE CONSISTING OF INTERLOCKING RUBBER LINKS SHAPED TO CONTINUOUSLY FILL IN THE ANNULAR SPACE BETWEEN PIPE & WALL OPENING. PRESSURE PLATES SHALL BE DELRIN PLASTIC, BOLTS & NUTS SHALL BE 18.8 STAINLESS STEEL, SEALING ELEMENTS SHALL BE EPDM RUBBER.

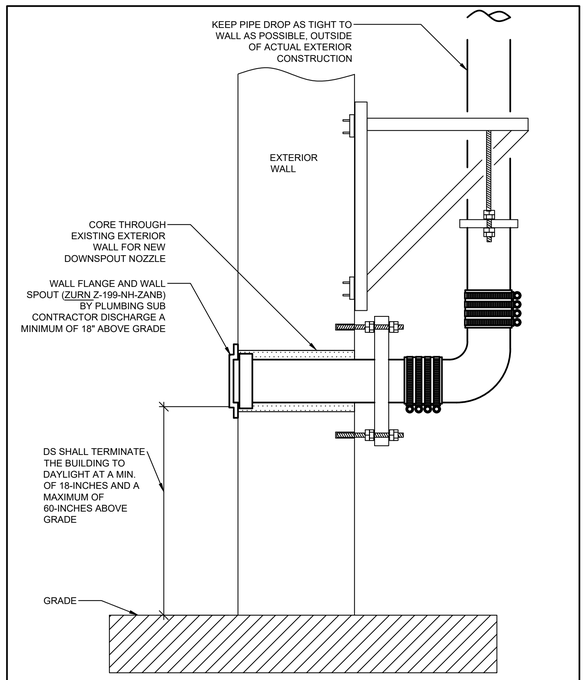
1 WATER TIGHT SEAL NTS



DETAIL OF HANGING PIPE FROM CORRUGATED METAL DECKING

NOTE:
WHERE HUB & SPIGOT PIPING IS SPECIFIED ALL HANGING AND INSULATION DETAILS SHALL BE SIMILAR. REFER TO HANGER DETAILS FOR HANGERS, INSULATION ETC.

2 STORM DRAIN PIPING INSULATION OFFSETS NTS



3 OVERFLOW ROOF DRAIN DOWNSPOUT NOZZLE NTS

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Phone: (617) 523-6227 www.rwsullivan.com
RWS JOB # 230155-000
ENG / DSN

STATE OF CONNECTICUT — PAUL D. SULLIVAN — 28161 — REGISTERED PROFESSIONAL ENGINEER

No.	Date	Description	By
A	03/04/2025	Issued for Bid	KMA

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

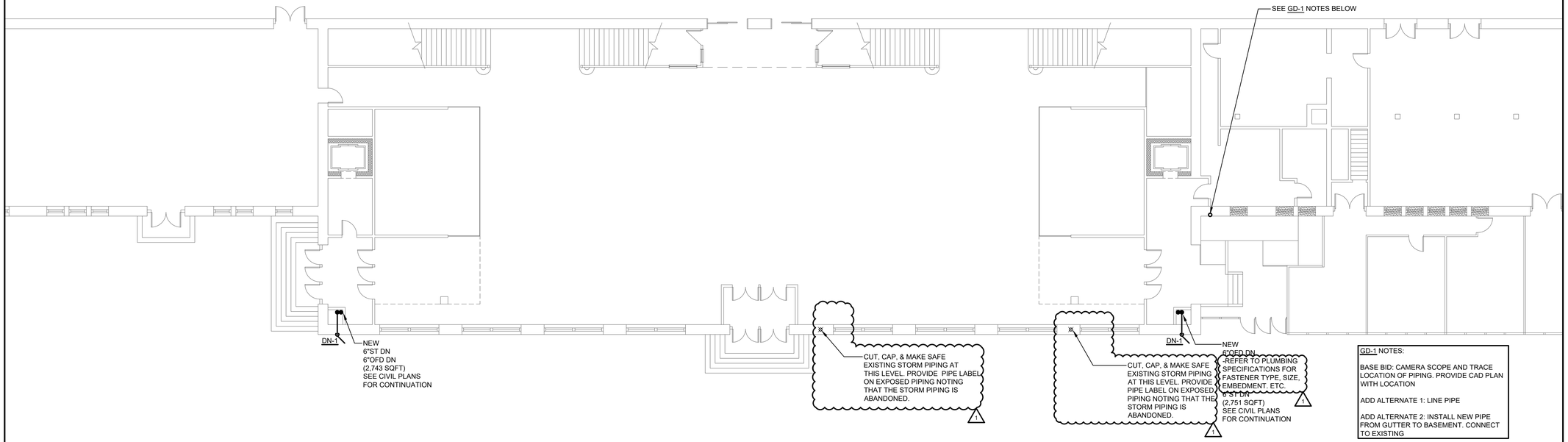
PLUMBING LEGEND, SCHEDULE, & DETAILS

Drawing Title

Project No.	Checked	Date
230979.00		02/12/2025
Drawn: KMA	Approved: JSH	Scale: NTS

Drawing No. P-0.0

Seal



GD-1 NOTES:

BASE BID: CAMERA SCOPE AND TRACE LOCATION OF PIPING. PROVIDE CAD PLAN WITH LOCATION

ADD ALTERNATE 1: LINE PIPE

ADD ALTERNATE 2: INSTALL NEW PIPE FROM GUTTER TO BASEMENT. CONNECT TO EXISTING

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RWS JOB # 220195-000
ENG / DSN

STATE OF CONNECTICUT · PAUL D. SULLIVAN · 27161 · REGISTERED PROFESSIONAL ENGINEER

No.	Date	Description	By
A	03/04/2025	Issued for Bid	KMA

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

PLUMBING DEMO/NEW FIRST FLOOR PLAN

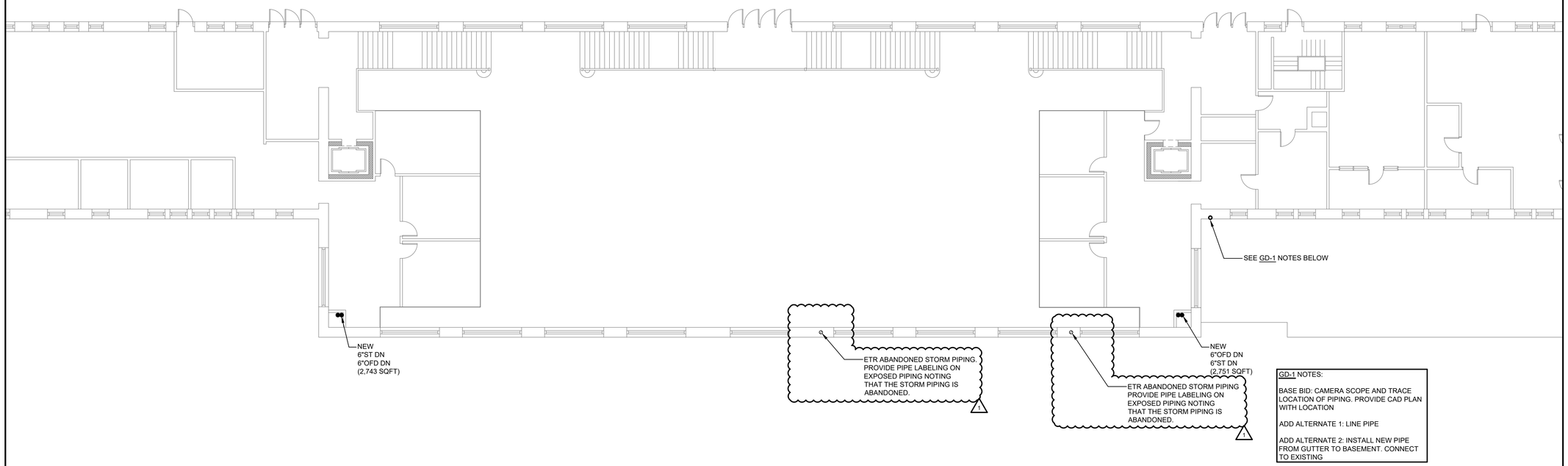
Drawing Title

Project No.	Checked	Date
230979.00		02/12/2025
Drawn: KMA	Approved: JSH	Scale: 3/32" = 1"

Seal

Drawing No.

P-1.1



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RWS JOB # 220196-000
ENG / DSN

STATE OF CONNECTICUT
JAMES D. SULLIVAN
REGISTERED PROFESSIONAL ENGINEER

No.	Date	Description	By
A	03/04/2025	Issued for Bid	KMA

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

PLUMBING DEMO/NEW SECOND FLOOR PLAN

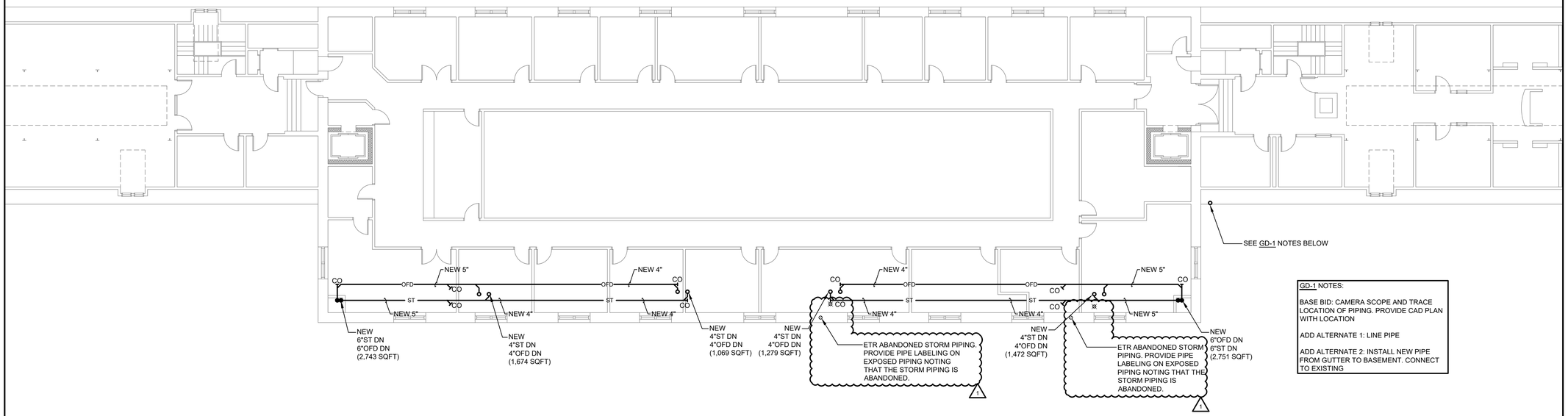
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Project No.	Checked	Date
230979.00		02/12/2025
Drawn: KMA	Approved: JSH	Scale: 3/32" = 1"

Seal

Drawing No.

P-1.2



GD-1 NOTES:

BASE BID: CAMERA SCOPE AND TRACE LOCATION OF PIPING. PROVIDE CAD PLAN WITH LOCATION

ADD ALTERNATE 1: LINE PIPE

ADD ALTERNATE 2: INSTALL NEW PIPE FROM GUTTER TO BASEMENT. CONNECT TO EXISTING

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RWS JOB # 220195-000
ENG / DSN

STATE OF CONNECTICUT · PAUL D. SULLIVAN · 27010 · REGISTERED PROFESSIONAL ENGINEER

No.	Date	Description	By
A	03/04/2025	Issued for Bid	KMA

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

PLUMBING DEMO/NEW THIRD FLOOR PLAN

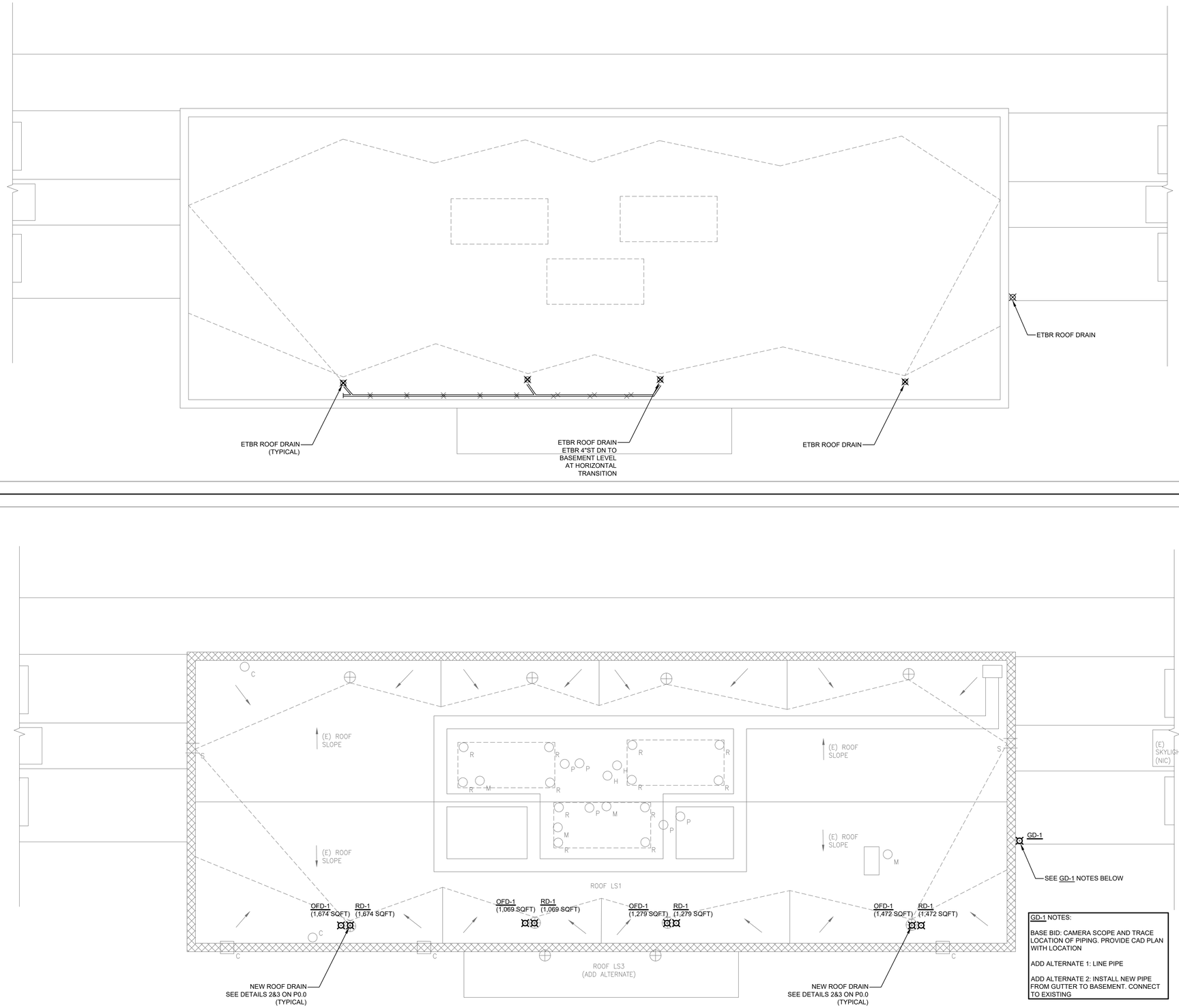
Drawing Title

Project No.	Checked	Date
230979.00		02/12/2025
Drawn: KMA	Approved: JSH	Scale: 3/32" = 1"

Seal

Drawing No.

P-1.3



1 Existing Roof Plan
3/32" = 1'-0"

GD-1 NOTES:

BASE BID: CAMERA SCOPE AND TRACE LOCATION OF PIPING. PROVIDE CAD PLAN WITH LOCATION

ADD ALTERNATE 1: LINE PIPE

ADD ALTERNATE 2: INSTALL NEW PIPE FROM GUTTER TO BASEMENT. CONNECT TO EXISTING

2 New Roof Plan
3/32" = 1'-0"

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RWS JOB # 220196-000
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No.	Date	Description	By
A	03/04/2025	Issued for Bid	KMA

ROOF DRAIN LINE REPAIR AT HARTFORD UNION STATION

1 HARTFORD PL, HARTFORD CT 06103

Project

PLUMBING DEMO/NEW ROOF PLAN

Drawing Title

Project No.	Checked	Date
230979.00		10/11/2024
Drawn	Approved	Scale
KMA	JSH	3/32" = 1"

Drawing No.

P-1.4

Seal

ABBREVIATIONS

A	
ABOVE FINISHED FLOOR	A.F.F.
ACOUSTICS CEILING PANEL	ACT.
ALUMINUM	ALUM.
ANGLE	ANG.
ARCHITECTURAL	ARCH.
AIR/VAPOR BARRIER	AVB.
AUTOMATIC	AUTO.
-B	
BARRIER-FREE	B.F.
BEAM	BM.
BOARD	BD.
BOTTOM OF	B/, B.O.
-C	
CAST-IN-PLACE	C.I.P.
CARPET	CPT.
CENTER	CT.
CENTERLINE	C.L.
CLEAR/CLEARANCE	CLR.
COLD FORMED METAL FRAMING	C.F.M.F.
COLUMN	COL.
CONCRETE MASONRY UNIT	C.M.U.
CONCRETE	CONC.
CONTINUOUS	CONT'S
-D	
DAYLIGHT OPENING	D.L.O.
DETAIL	DET.
DETAILS	DET'S
DIAMETER	DIA.
DOOR OPENING	D.O.
DRAWING	DWG.
DRAWINGS	DWG'S
-E	
ELECTRICAL	ELECT.
ELEVATION	EL.
EQUAL	EQ.
EQUIPMENT	EQUIP.
EXISTING	EXIST.
EXPANSION	EXP.
EXTERIOR	EXT.
-F	
FEET	FT.
FIBERGLASS	F.G.
FINISH FLOOR	F.F.
FINISH FLOOR ELEVATION	F.F.E.L.
FINISH OPENING	F.O.
FLIGHT INFORMATION	FIDS.
DISPLAY SCREEN	F.D.
FLOOR DRAIN	FTG.
FOOTING	FND.
FOUNDATION	F.E.W.
FROM EXISTING WALL	F.F.W.
FROM FINISH WALL	
-G	
GALVANIZED	GAL.
GAUGE	GA.
GENERAL CONTRACTOR	G.C.
GYPSUM	GWB.
-H	
HEIGHT	HGT.
HOLLOW METAL	H.M.
HORIZONTAL	HORZ.
HOUR	HR.
-I	
ILLUMINATED	ILLUM.
INSIDE DIAMETER	I.D.
INSULATED/INSULATION	INSUL.
INTERIOR	INT.
INTERMEDIATE	INTER.
INVERT	INV.
-J	JT.
JOINT	JTS.
JOINTS	
-K-	
-L	L.H.
LEFT HAND	L.H.R.
LEFT HAND REVERSE	L.E.D.
LIGHT EMITTING DIODE	L.L.H.
LONG LEG HORIZONTAL	L.L.V
LONG LEG VERTICA	

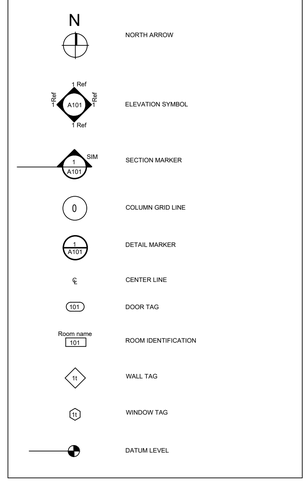
ABBREVIATIONS

M	
MACHINE	MACH.
MANUFACTURE	MFG.
MASONRY OPENING	M.O.
MAXIMUM	MAX.
MECHANICAL	MECH.
METAL	MTL.
METAL PANEL PERFORATED	MCP.
METAL SOFFIT & WALL PANEL	EMP.
MINIMUM	MIN.
MISCELLANEOUS	MISC.
-N	
NOT AVAILABLE	N.A.
NOT IN CONTRACT	N.I.C.
NOT TO SCALE	N.T.S.
-O	
OCCUPANCY	OCC.
ON CENTER	O.C.
OPPOSITE	OPP.
OPENING	OPG.
OUTSIDE DIAMETER	O.D.
OVERHEAD	O.H.
-P	
PAY ON FOOT	P.O.F.
PERFORATED	PERF.
PLATE	PL.
PLYWOOD	PLY.
PRECAST CONCRETE	P.C.C.
-Q-	
-RRADIUS	RAD.
REFERENCE	REF.
REFLECTED FLOOR PLAN	RFP.
REINFORCEMENT	REINF.
REQUIRED	REQ. OR REQ'D
RIGHT HAND	R.H.
RIGHT HAND REVERSE	R.H.R.
ROOM	RM.
ROUGH OPENING	R.O.
-S	
SANITATION	SAN.
SCHEDULE	SCHED.
SECTION	SECT.
SHEET	SHT.
SIMILAR	SIM.
SPANDREL	SPL.
SPECIFICATIONS	SPEC'S.
SQUARE	SQ.
STAINLESS STEEL	S.STL. OR S.S.
STANDARD	STD.
STEEL	STL.
STRUCTURAL	STRUC.
-T	
TO BE DETERMINED	T.B.D.
TOP OF	T/, T.O.
TOP OF CURB	T/CURB
TOP OF PRECAST	T/P.C.C.
TOP OF SPANDREL	T/SPL
TOP OF STEEL	T/STL.
TOP OF WALL	T/WALL
TRAFFIC BEARING WATERPROOFING	T.B.W.P.
TYPICAL	TYP.
-U	
UNLESS NOTED OTHERWISE	U.N.O.
-V	
VERTICAL	VERT.
VERIFY IN FIELD	V.I.F.
VINYL COMPOSITION TILE	VCT
-W	
WITH	W/
WITHOUT	W/O
WOOD	WD
-X-	
-Y-	
-Z	

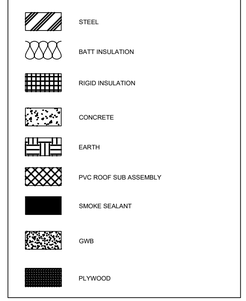
ARCHITECTURAL GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ AND INTERPRETED AS ONLY A PORTION OF THE CONTRACT DOCUMENTS, WHICH INCLUDE DRAWINGS FROM OTHER DISCIPLINES AND SPECIFICATIONS.
2. GENERAL CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AS APPLICABLE INCLUDING BUT NOT LIMITED TO ELECTRICAL, LIGHTING, MECHANICAL AND ALL BUILDING DISCIPLINES.
3. ALL DIMENSIONS TO BE VERIFIED IN FIELD.
4. ALL WORK INCLUDED IN THIS CONTRACT SHALL CONFORM TO ALL MUNICIPAL, STATE, NATIONAL AND OTHER CODES, REGULATIONS AND RESTRICTIONS WHICH APPLY TO THIS PROJECT INCLUDING THE FEDERAL "AMERICANS WITH DISABILITIES ACT" (ADA).
5. ALL WORK SHALL BE OF HIGH QUALITY, PERFORMED IN A NEAT WORKMANLIKE MANNER, EXECUTED IN ACCORDANCE WITH THE BEST ACCEPTED TRADE PRACTICES AND AS PER MANUFACTURER 'S RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
6. ALL INDICATED ELEMENTS ARE "NEW" UNLESS OTHERWISE INDICATED BY SUCH TERMINOLOGY AS "EXISTING", "TEMPORARY", "ABANDONED", "REFURBISHED", ETC.
7. THE CONTRACT SHALL PROVIDE DUST PROTECTION TO ALL EXISTING TO REMAIN RACKS AND EQUIPMENT DURING THE COURSE OF CONSTRUCTION. NO INTERRUPTION TO EQUIPMENT IS PERMITTED WITHOUT COORDINATION AND APPROVAL BY THE AHJ.
8. ALL MATERIALS AND WORK REQUIRED SHALL BE NEW UNLESS OTHERWISE NOTED.
9. ALL FIRE-RATED DOORS AND PENETRATIONS THROUGH FLOOR, WALL AND/OR CEILINGS SHALL COMPLY WITH APPLICABLE CODE REQUIREMENTS OF (TEMPERATURE) T-RATINGS AND UL-LISTED THROUGH PENETRATION FIRE STOP SYSTEM ASSEMBLIES TO THE APPROVAL OF THE AHJ.
10. ALL FIRE-RATED PARTITIONS/WALLS SHALL EXTEND TO THE UNDERSIDE OF THE STRUCTURAL FLOOR, BEAM OR ROOF SLAB – UNLESS NOTED OTHERWISE; AND SHALL BE FIRE-STOPPED TO SAME HOURLY RATING. ALL PENETRATIONS SHALL BE SEALED AND PROTECTED IN ORDER TO MAINTAIN THE INTEGRITY OF THE FIRE-RATED PARTITIONS/WALLS. SEE SPECIFICATIONS.
11. THE WORDS "REMOVE", "REMOVAL", "DISCARD", "DISPOSE OF" SHALL INCLUDE THE COMPLETE REMOVAL AND LEGAL DISPOSAL OF THE INDICATED MATERIAL OR EQUIPMENT OFF THE SITE BY CONTRACTOR, EXCEPT WHERE SUCH MATERIAL OR EQUIPMENT IS INDICATED OR DIRECTED BY THE DESIGNER/AHJ TO BE SALVAGED OR STORED FOR RE-INSTALLATION. ALL REQUIRED STORAGE SHALL BE AT THE CONTRACTOR 'S EXPENSE.
12. THE CONTRACTOR SHALL PROTECT AND PRESERVE ALL EXISTING ITEMS TO REMAIN, ALL WORK FROM HAND-OVER OR PRECEDING CONTRACTS, OWNER FURNISHED EQUIPMENT AND FIXTURES; AND REPAIR OR REPLACE ANY ITEMS DAMAGED DURING THE COURSE OF THE WORK TO THE SATISFACTION AND APPROVAL OF THE MPA.
13. ANY DAMAGE TO INSTALLED FINISHES OR EQUIPMENT CAUSED BY THE WORK OF THE CONTRACTOR SHALL BE REPLACED AND REINSTALLED BY THE CONTRACTOR TO THE SATISFACTION AND APPROVAL OF THE AHJ.
14. THE CONTRACTOR SHALL PATCH ALL AREAS AFFECTED OR EXPOSED BY REMOVALS WORK TO MATCH EXISTING AND/OR ADJACENT SURFACES TO THE APPROVAL OF THE AHJ. PATCHING OF ALL AREAS AFFECTED SHALL ALSO MAINTAIN THE ASSEMBLY AND/OR SYSTEM INTEGRITY AND PERFORMANCE OF THE ORIGINAL CONSTRUCTION.
15. ALL MATERIALS AND EQUIPMENT THAT ARE SCHEDULED FOR DEMOLITION SHALL BE REMOVED FROM SITE AND DISPOSED OF PER SPECIFICATIONS. CONFORM TO LOCAL AND STATE REQUIREMENTS FOR REMOVAL AND DISPOSAL OF CONSTRUCTION MATERIAL. CONTRACTOR TO COORDINATE POTENTIAL FOR SALVAGING DEMOLITION MATERIAL WITH THE AHJ.
16. THE CONTRACTOR SHALL NOTIFY THE MPA/DESIGNER OF ANY AND ALL DISCREPANCIES BETWEEN EXISTING CONDITIONS, INCLUDING INSTALLED WORK AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE TO NOTIFY THE AHJ/DESIGNER DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO PERFORM THE WORK AS INTENDED BY THE CONTRACT DOCUMENTS.
17. THE CONTRACTOR SHALL CORRECT ANY AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES AS INTENDED BY THE CONTRACT DOCUMENTS AND TO THE SATISFACTION OF THE AHJ. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK AMONG THE VARIOUS TRADES.
18. WHERE THERE ARE DISCREPANCIES IN THE CONTRACT DRAWINGS BETWEEN DISCIPLINES OR WHERE WORK IS SHOWN ON THE DRAWINGS FOR ONE DISCIPLINE BUT NOT ANOTHER, THE CONTRACTOR SHALL PERFORM THE MOST COMPLETE AND STRINGENT REQUIREMENT SHOWN AND AS DIRECTED BY THE DESIGNER. THE DESIGNER SHALL BE NOTIFIED OF ALL SUCH DISCREPANCIES BEFORE COMMENCING THE WORK.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS AND JOB CONDITIONS IN THE FIELD. THE CONTRACTOR SHALL NOTIFY THE DESIGNER OF ANY DISCREPANCIES PRIOR TO COMMENCING CONSTRUCTION, SUBMITTING OF SHOP DRAWINGS, PLACING ORDERS, AND/OR FABRICATING EQUIPMENT DURING THE COURSE OF THE CONTRACT.
20. DO NOT SCALE DRAWINGS. FOLLOW WRITTEN DIMENSIONS ONLY.
21. WHERE THE PROGRESS OF THE WORK INTERFERES WITH A MEANS OF EGRESS FROM AN EXISTING BUILDING OR STRUCTURE, THE CONTRACTOR SHALL PROVIDE A TEMPORARY MEANS OF EGRESS SUBJECT TO THE APPROVAL OF THE AUTHORITIES HAVING JURISDICTION (AHJ) AND (BUILDING) OWNER AT NO COST TO THE OWNER.
22. WHERE RECESSES, OFFSETS AND CHASES ARE SHOWN IN WALL PARTITIONS, THE EXACT SIZE OF THE OPENING REQUIRED SHALL BE DETERMINED BY THE INSTALLATION ITEM TO BE ACCOMMODATED. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL OTHER TRADES.
23. FOR SIZE, EXTENT AND LOCATION OF OPENINGS, SLEEVES, CHASES AND OTHER PENETRATIONS (i.e. RACEWAYS, CONDUITS, MECHANICAL AND UTILITY DUCTS, PIPING, ETC. AND THROUGH WALLS AND FLOORS, SEE RELATED STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
24. PRIOR TO INSTALLATION OF ANY ELEMENT OF THE WORK, THE CONTRACTOR SHALL SUBMIT ALL APPROVED SHOP DRAWINGS, COORDINATION SHOP DRAWINGS, TESTING & COMMISSIONING REPORTS, MOCK-UPS, COLORS AND FINISHES TO THE DESIGNER FOR APPROVAL OF THE ELEMENTS.
25. PROVIDE ALL BLOCKING, SEPARATION AND ANCHORAGE AS REQUIRED FOR CODE-COMPLIANT WORK.
26. WHERE DISSIMILAR METALS ARE JOINED, METAL SURFACES SHALL BE ADEQUATELY SEPARATED TO PREVENT GALVANIC ACTION AND CORROSION.
27. THE CONTRACTOR SHALL PAINT ALL SURFACES, INCLUDING BUT NOT LIMITED TO: EXPOSED WALLS (WITH NO FINISH ASSEMBLY), EXPOSED CEILINGS (WITH NO SUSPENDED ASSEMBLY), EXPOSED STRUCTURAL COLUMNS, PIPES, CONDUIT, AND MISCELLANEOUS METALS – UNLESS NOTED OTHERWISE OR AS INDICATED ON THE CONTRACT DRAWINGS.
28. DOORS, WHETHER TEMPORARY OR PERMANENT INSTALLATIONS, SHALL BE INSTALLED TO ENSURE PROPER AND CLEAR DOOR SWING INTO OR OUTWARD OF THE ROOM, COORDINATING THE HINGE SIDE OF DOOR ASSEMBLY WITH THE (LOW POINT) FINISH FLOOR ELEVATION AND MAKING REQUIRED ADJUSTMENT TO ACCOMMODATE DOOR SWING PATH.
29. SEAL AND CAULK AROUND ALL PENETRATIONS, CRACKS AND CREVICES AND ANY OPENINGS CAPABLE OF HARBORING INSECTS AND RODENTS.

SYMBOLS LEGEND



MATERIALS REFERENCE



SIMPSON GUMPERTZ & HEGER
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Waltham, MA 02451
781.907.9000
sgh.com

Consultant

DHK ARCHITECTS

No.	Date	Description	By
C	5/9/2025	ISSUED FOR RE-BID	JB
B	3/4/2025	100% Bid Set	BS
A	11/27/2024	100% Pricing Set	SPD

UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

GENERAL NOTES

Drawing Title

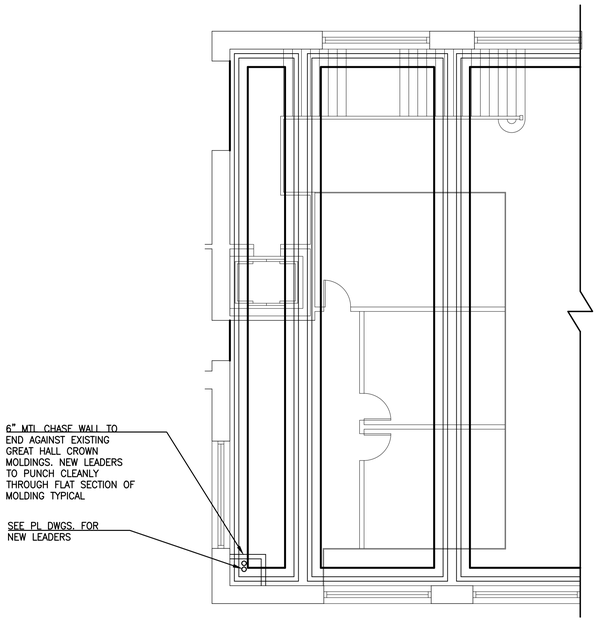
Project No. 230979.00	Checked WG	Date SEE ABOVE
Drawn JB	Approved BS	Scale AS NOTED

STATE OF CONNECTICUT ARNOLD M. KROCKMALNIC NO. 10255 LICENSED ARCHITECT

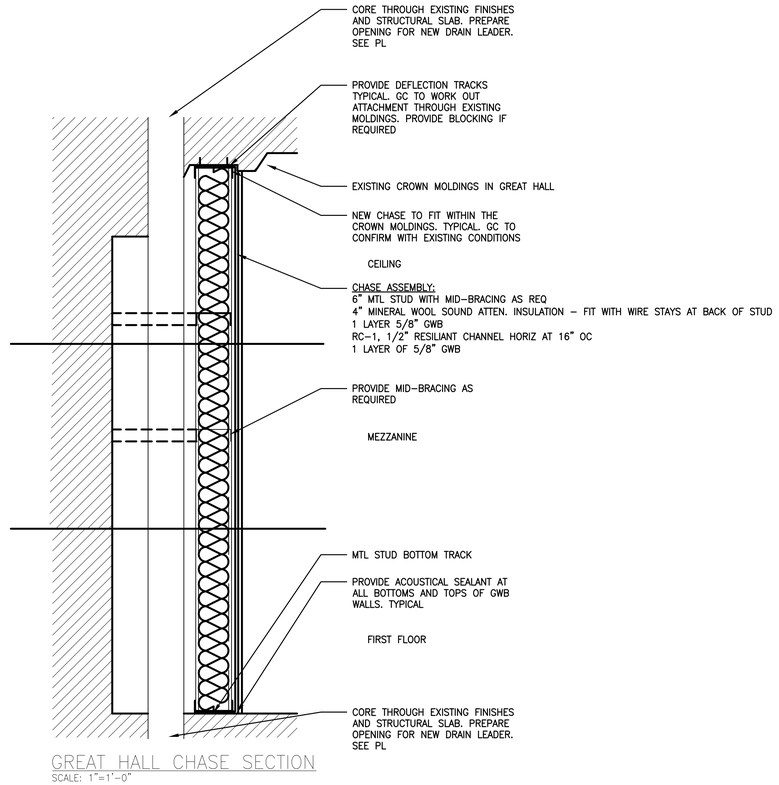
Seal

Drawing No.

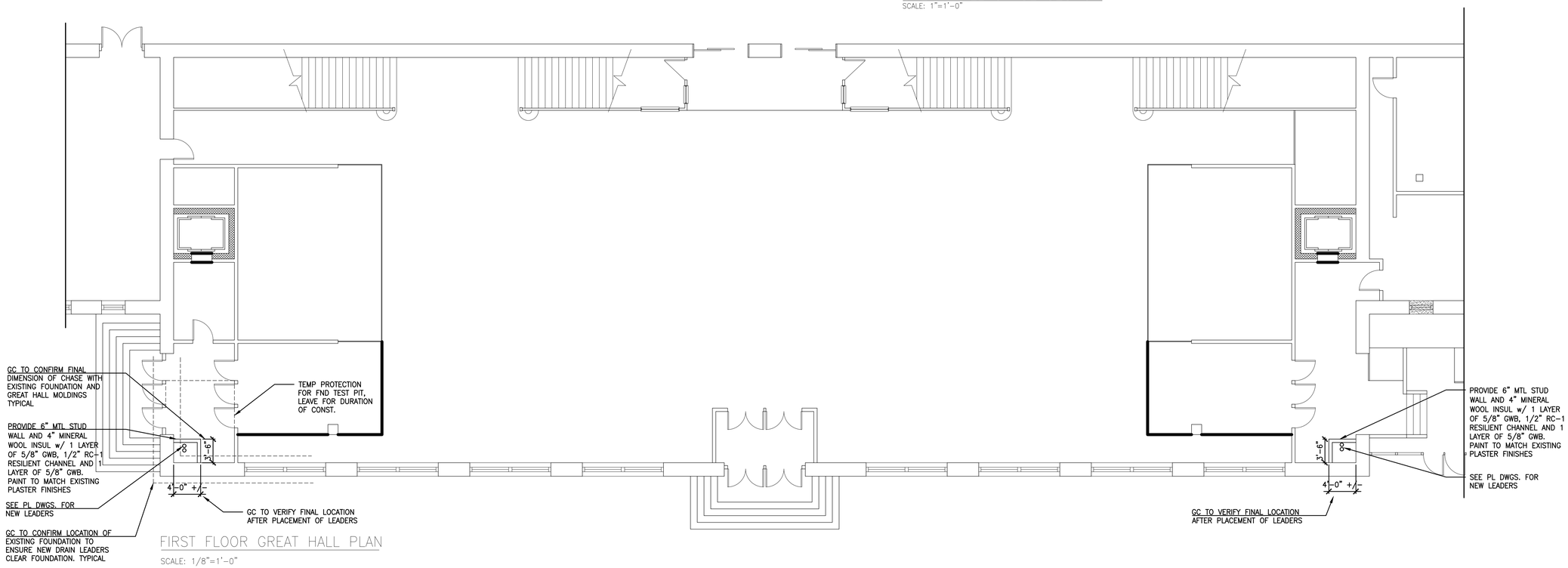
A-00



PARTIAL GREAT HALL RCP
SCALE: 1/8"=1'-0"



GREAT HALL CHASE SECTION
SCALE: 1"=1'-0"



FIRST FLOOR GREAT HALL PLAN
SCALE: 1/8"=1'-0"

SIMPSON GUMPERTZ & HEGER
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Consultant

No.	Date	Description	By
C	5/9/2025	ISSUED FOR RE-BID	JB
B	3/4/2025	100% Bid Set	BS
A	11/27/2024	100% Pricing Set	SPD

UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

GREAT HALL PLAN AND RCP

Drawing Title

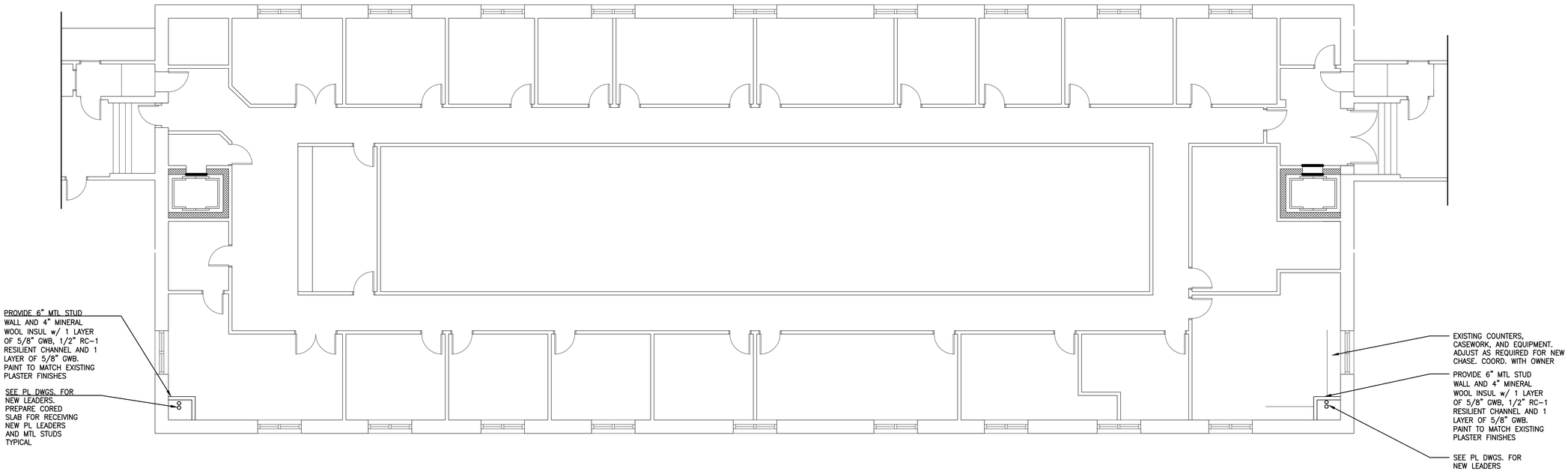
Project No.	Checked	Date
230979.00	WG	SEE ABOVE
Drawn	Approved	Scale
JB	BS	AS NOTED

STATE OF CONNECTICUT ARNOLD H. KROCKMALNIC NO. 19235 LICENSED ARCHITECT

Seal

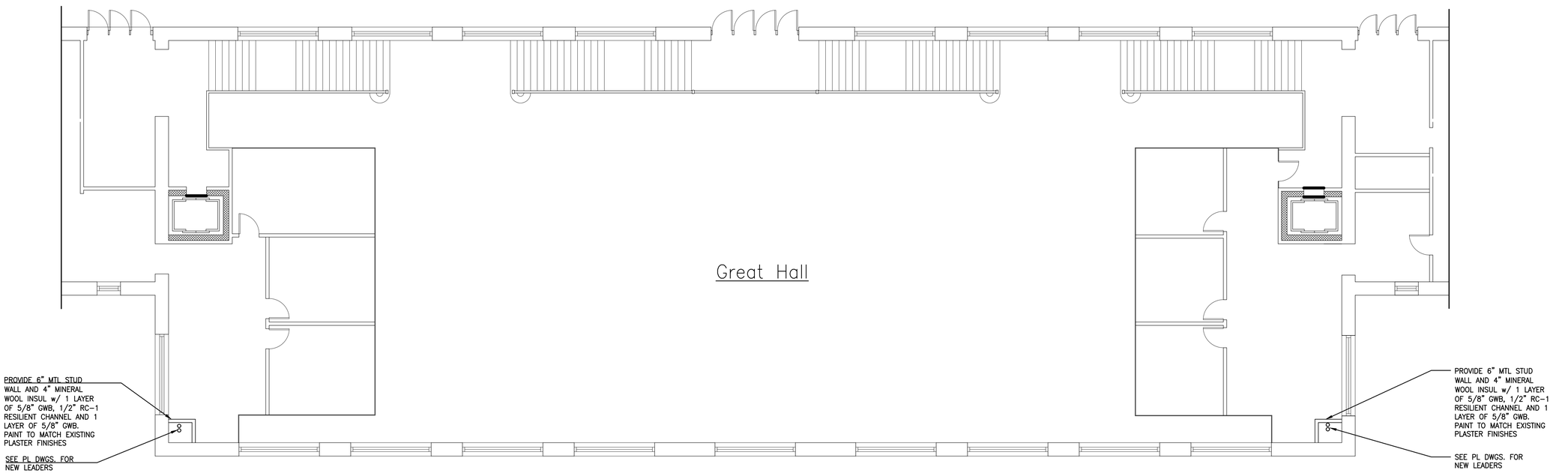
Drawing No.

A-01



THIRD FLOOR PLAN

SCALE: 1/8"=1'-0"



SECOND FLOOR MEZZANINE PLAN

SCALE: 1/8"=1'-0"

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UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

MEZZANINE AND THIRD FLOOR PLAN

Drawing Title

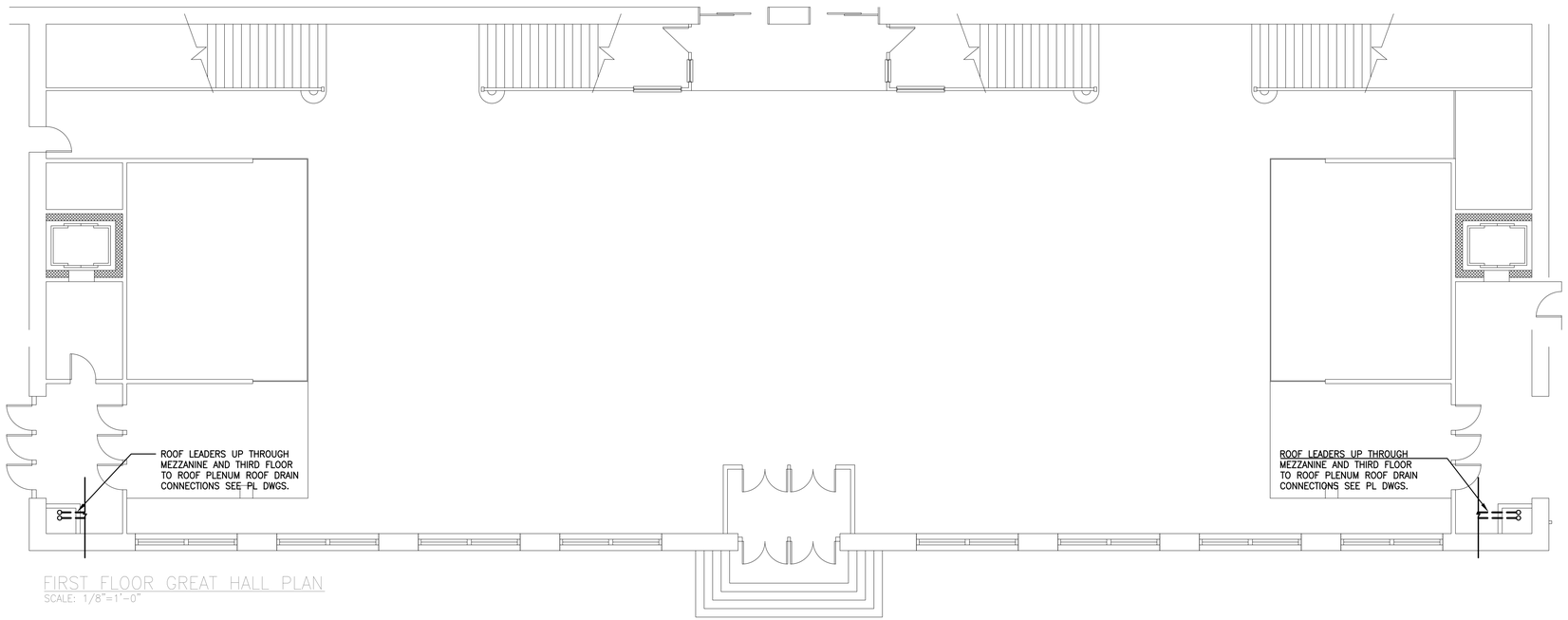
Project No.	Checked	Date
230979.00	WG	SEE ABOVE
Drawn	Approved	Scale
JB	BS	AS NOTED

STATE OF CONNECTICUT ARNOLD W. KROCKMALNIC LICENSED ARCHITECT NO. 10235

Seal

Drawing No.

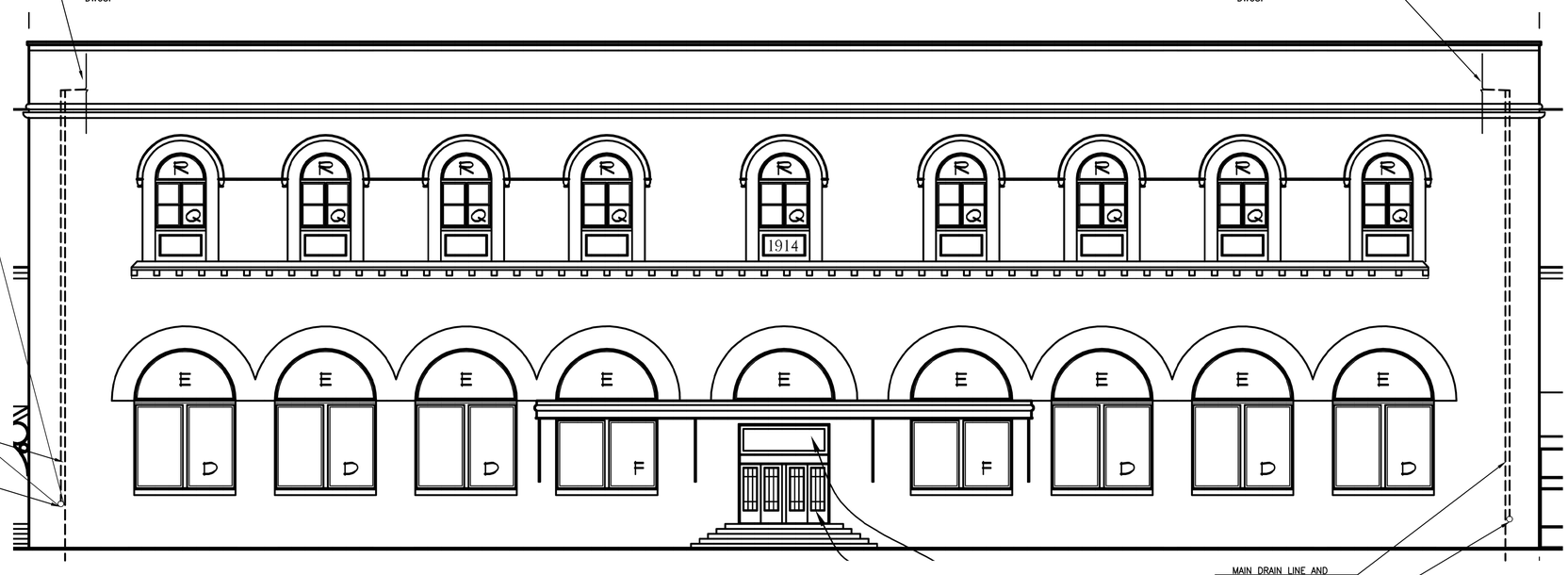
A-02



FIRST FLOOR GREAT HALL PLAN
SCALE: 1/8"=1'-0"

OVERFLOW OUTLET INTENT:
BASED ON ZURN MODEL ZANB
199 DOWNSPOUT NOZZLE FINISH
BRONZE





FRONT ELEVATION DRAINAGE DIAGRAM
SCALE: 1/8"=1'-0"

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UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

FRONT ELEVATION DRAINAGE DIAGRAM

Drawing Title

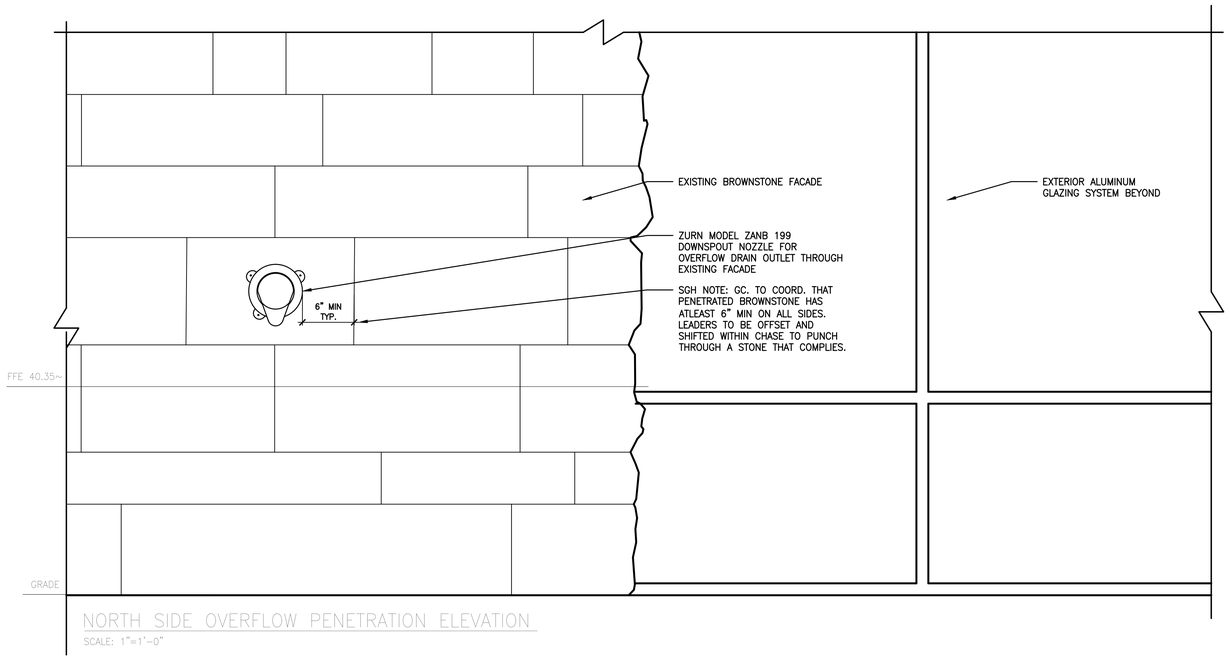
Project No.	Checked	Date
230979.00	WG	SEE ABOVE
Drawn	Approved	Scale
JB	BS	AS NOTED

STATE OF CONNECTICUT ARNOLD W. KROCKMALNIC No. 10255 LICENSED ARCHITECT

Seal

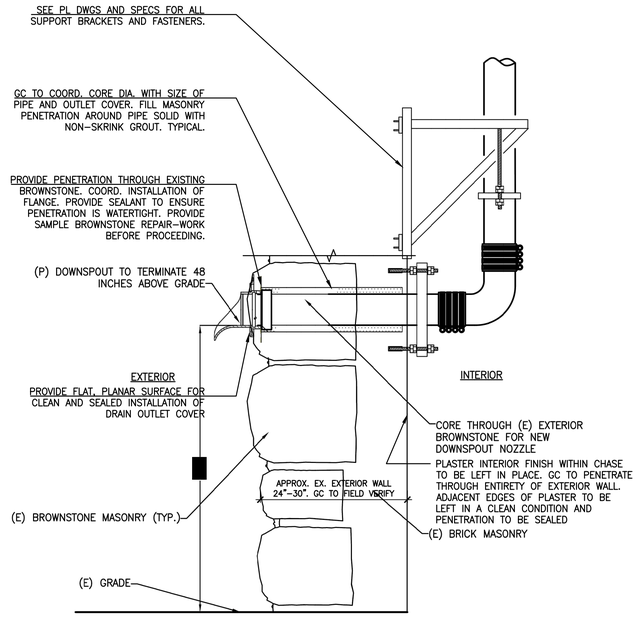
Drawing No.

A-03



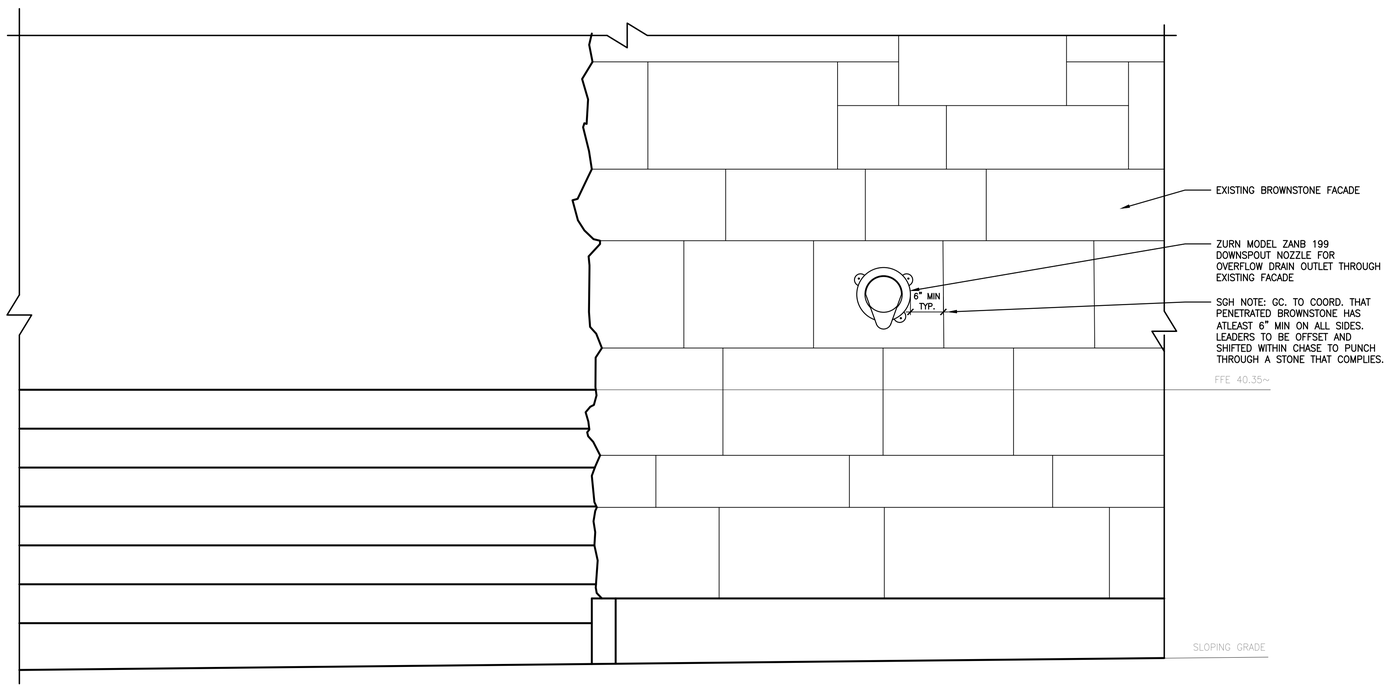
NORTH SIDE OVERFLOW PENETRATION ELEVATION

SCALE: 1"=1'-0"



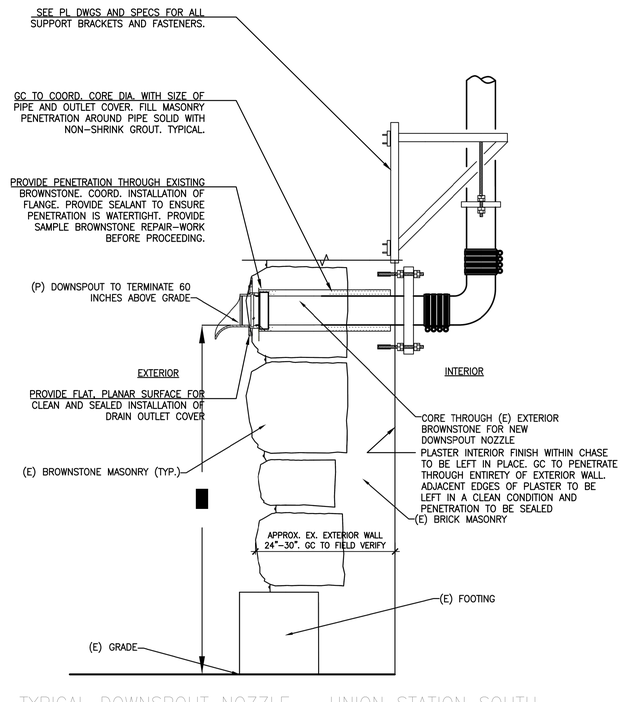
TYPICAL DOWNSPOUT NOZZLE – UNION STATION NORTH

SCALE: NTS



SOUTH SIDE OVERFLOW PENETRATION ELEVATION

SCALE: 1"=1'-0"



TYPICAL DOWNSPOUT NOZZLE – UNION STATION SOUTH

SCALE: NTS

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DHK ARCHITECTS

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C	5/9/2025	ISSUED FOR RE-BID	JB
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UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

OVERFLOW DRAIN DETAILS

Drawing Title

Project No.	Checked	Date
230979.00	WG	SEE ABOVE
Drawn	Approved	Scale
JB	BS	AS NOTED

STATE OF CONNECTICUT ARNOLD M. KROCHALIS LIC. NO. 10255 LICENSED ARCHITECT

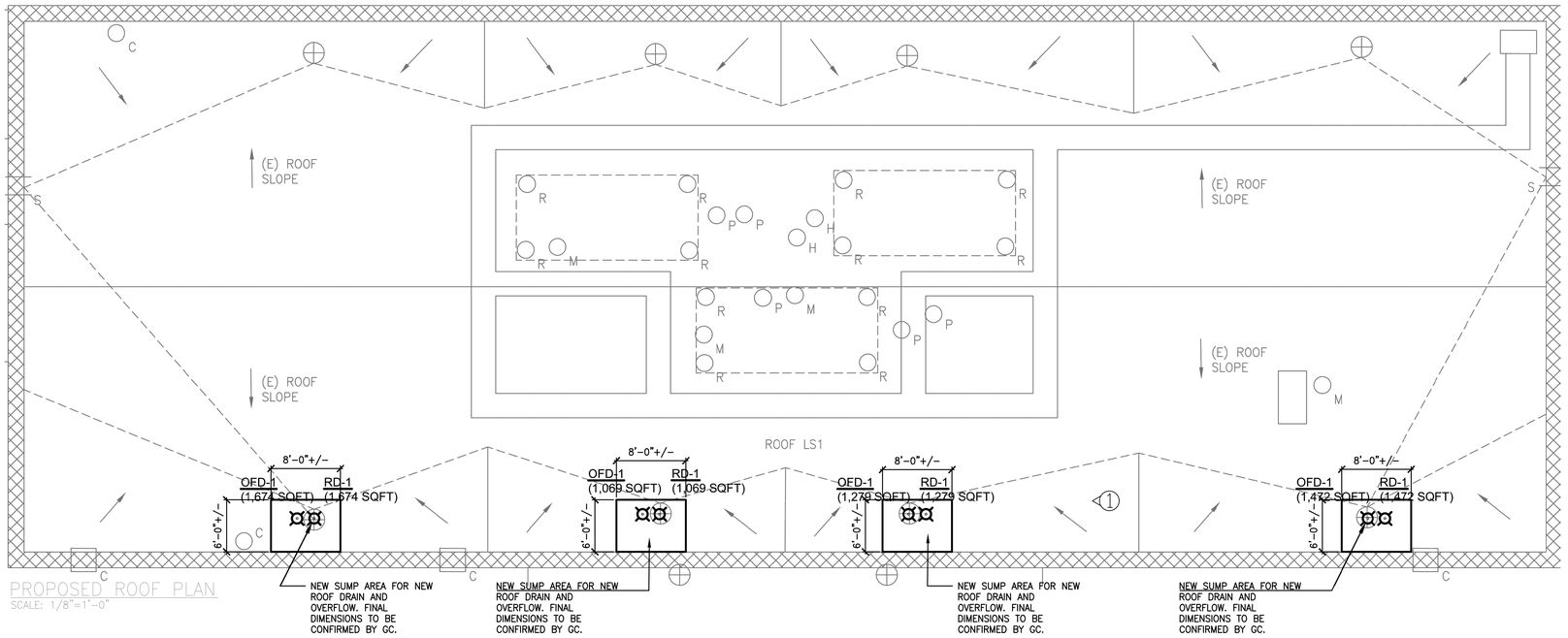
Seal

Drawing No.

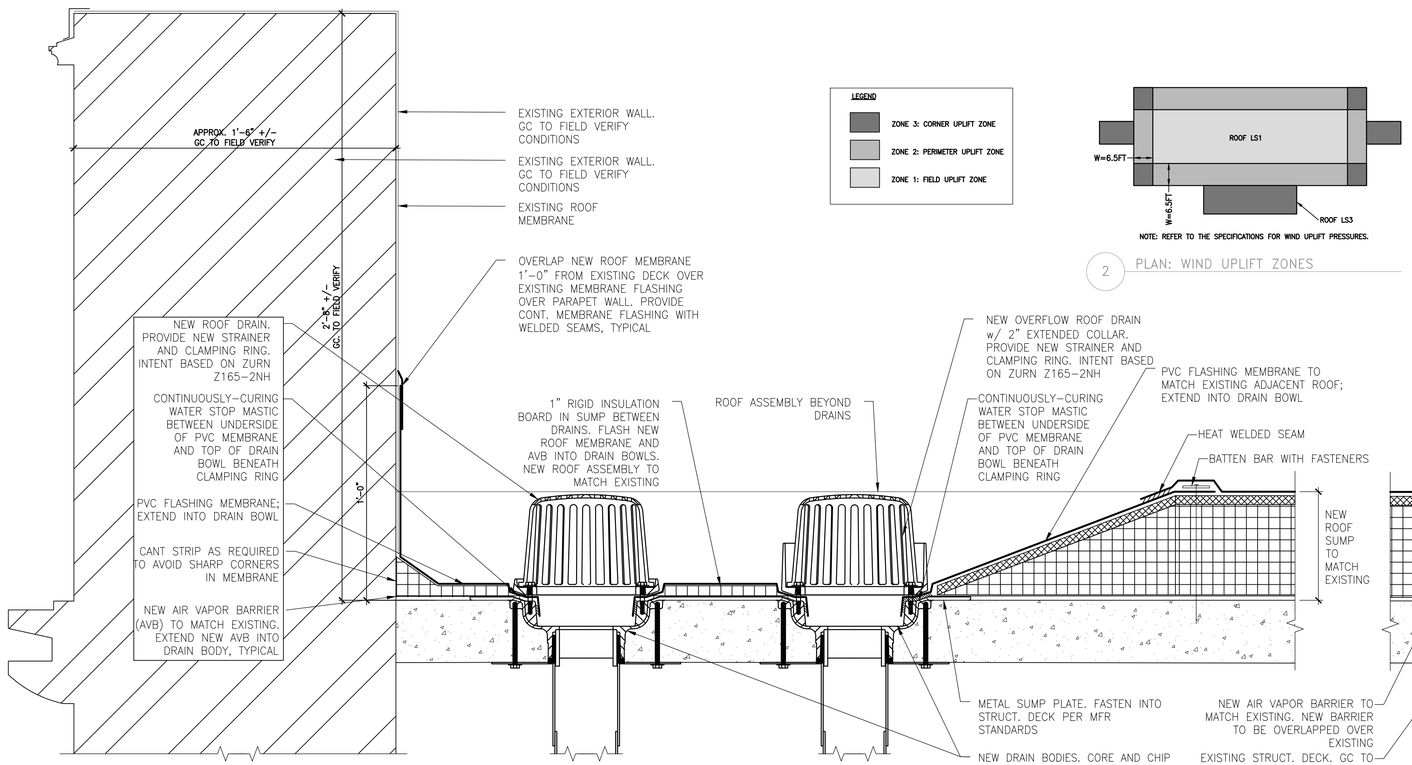
A-04



1 EXISTING PHOTO 1



PROPOSED ROOF PLAN
SCALE: 1/8"=1'-0"



TYPICAL ROOF DRAIN AND OVERFLOW DETAIL AGAINST EXISTING EXT. WALL AND ROOF
SCALE: 3"=1'-0"

2 PLAN: WIND UPLIFT ZONES

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Consultant DHK ARCHITECTS

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UNION STATION TRANSPORTATION CENTER ROOF DRAIN LINE REPAIR

1 HARTFORD PL, HARTFORD CT 06103

Project

ROOF DETAILS

Drawing Title

Project No.	Checked	Date
230979.00	WG	SEE ABOVE
Drawn	Approved	Scale
JB	BS	AS NOTED

STATE OF CONNECTICUT ARNOLD M. KROCHMALNY LIC. NO. 19255 LICENSED ARCHITECT

Seal

Drawing No. A-05