



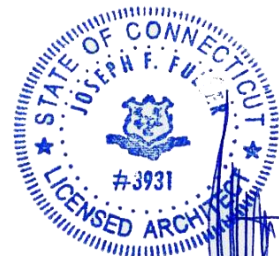
**SPECIFICATION BOOKLET  
GREENWICH PUBLIC SCHOOLS  
MILBANK SCHOOL  
LIFE SKILLS CLASSROOM AND RELATED ITEMS**



OWNER:	<b>GREENWICH PUBLIC SCHOOLS</b>
ADDRESS:	<b>290 GREENWICH AVENUE</b>
CITY:	<b>GREENWICH, CT 06830</b>
BOARD OF EDUCATION BID NUMBER:	<b>2406-23</b>
FULLER AND D'ANGELO PROJECT NO:	<b>22495.00</b>
FACILITY NAME:	<b>MILBANK SCHOOL 200 EAST ELM STREET GREENWICH, CT 06830</b>



**FULLER AND D'ANGELO, P.C.  
ARCHITECTS & PLANNERS  
45 KNOLLWOOD ROAD  
ELMSFORD, NEW YORK 10523  
(914) 592-4444  
[www.fullerdangelo.com](http://www.fullerdangelo.com)**



**DATE ISSUED FOR BID: FEBRUARY 17<sup>TH</sup>, 2023**

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**GREENWICH PUBLIC SCHOOLS**  
**Purchasing Department**

290 Greenwich Ave  
Greenwich, CT 06830  
(203) 625-7411 Tel  
[eugene\\_watts@greenwich.k12.ct.us](mailto:eugene_watts@greenwich.k12.ct.us)

**EUGENE H. WATTS**  
**Senior Buyer**

February 17, 2023

Dear Sir/Madam:

You are invited to submit a bid for Life Skills Room & Related Work at Milbank School.

The enclosed bid specification details the requirements we are looking for.

Bidders are urged to read all documents carefully and fill out all information requested. Bids which are incomplete, obscure, or conditional, and which contain irregularities of any kind, will be subject to rejection for failure to comply strictly with these conditions.

Bids must be submitted on the schedule forms attached. All unit prices must be filled in. Each bid must be submitted and clearly marked as (1) original and three (3) copies of the bid. Bidders must submit bids in a clear, concise and legible manner to permit proper evaluation of responsive bid. *The cost sheet must be the first page of the submitted bid.* Faxed or emailed bids will not be accepted however, hand delivered, mailed or overnight bids will be accepted Monday through Friday between the hours of 8:30am -12:00pm and 1:30 pm - 3:00pm at: Greenwich Public Schools 290 Greenwich Avenue Greenwich, CT 06831. Late bids will not be accepted.

**Milbank School Life skills Room and Related Work**

**Opening Date: 3/16/23**

**Opening Time: 11:00 a.m.**

**Bid Number: 2406-23**

**MANDATORY WALK THROUGH: 2/23/23 AT 3:45 PM at Milbank School**

Sealed proposals for supplying the above will be received by the Purchasing Department at the above address until 11:00 a.m. at which time they will be opened and read.

All responses are subject to change based on the status of the COVID 19 pandemic and Federal Ordinances.

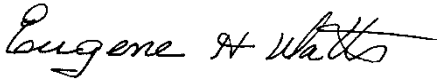
In accordance with the Governor's current public meeting requirements and in order to limit the spread of COVID-19, the meeting for the bid opening will be held remotely by telephone in real time. The details to join the meeting remotely are as follows:

**Dial-In by phone:**

[1 585-491-9199](tel:15854919199) PIN: 605 774 928#

All Bidders and other interested people are invited to call in to hear Bid 2406-23 being read at 1100 a.m.

Very truly yours,

A handwritten signature in black ink that reads "Eugene H. Watts". The signature is written in a cursive style with a horizontal line extending from the end of the name.

---

Eugene H. Watts

## **Information to Bidders Part 1**

The Architect for the project is Fuller D'Angelo P.C. Architects and Planners, 45 Knollwood Road, Elmsford, NY 10523

Contractor(s) whose bid exceeds \$500,000.00 shall hold a current "DAS" Contractor Prequalification Certificate" (not a predetermination letter) from the Department of Administrative Services of the State of Connecticut according to Connecticut General Statutes Section 4a-100, 4b-101 and 4b-91 previously stated as Public Act 03-215 and as amended by Public Act 04-141. Bidders shall submit with their bids, unless noted otherwise, a "DAS Contractor Prequalification Certificate" along with a current "Update (bid) Statement". Failure to submit those items with the bid will result in disqualification of the bidder. If you have any questions regarding these requirements contact the State of CT.DAS, at telephone number 860-713-5280 or visit their web site at [www.das.state.ct.us](http://www.das.state.ct.us) .

### **1. BACKGROUND:**

The Town of Greenwich, CT is about 30 miles northeast of New York City and has a population of about 60,000 people. The Greenwich Public Schools enjoy a national reputation for excellence and have strong support from the community. Our fifteen public schools have a current enrollment of 9000 students and consist of eleven elementary schools (K-5), three middle schools (6-8), and one comprehensive high school (9-12). Our district also offers some pre-K and alternative high schools programs.

### **2. CONTRACT LENGTH:**

This Bid is for awarding a contract to cover the period beginning on or about April 1, 2023. Once this Bid is awarded, the bidder must make arrangements to meet with Greenwich Public Schools if required.

### **3. OPTION TO EXTEND:**

The Board of Education may, at their option and with the approval of the vendor, extend the period of this agreement for the schools. If the Board of Education intends to extend the contract period, the vendor shall be notified in writing by the Purchasing Department at least fourteen (14) calendar days prior to the expiration of the original contract.

### **4. BID EVALUATION CRITERIA:**

A committee composed of various administrators will evaluate bids. The following criteria guidelines will be used in analyzing and evaluating this bid:

Conformance to the requirements of this Bid, i.e. conformance to Terms, Conditions and Scope of Work.

Proven skills and technical competence.

Background on the firm

For Vendor firm, identification of personnel who will have principal responsibility.

Qualifications Form

### **5. A NARRATIVE DESCRIBING THE FIRMS APPROACH TO UNDERTAKING THE SCOPE OF THE WORK INCLUDING:**

Cost/service fee (overall cost to the Board of Education with all factors considered).

Presentation to the selection committee, if requested.

6. AWARD OF CONTRACT:

The contract will be awarded by the Board of Education to the qualified firm or person at compensation determined to be fair and reasonable considering budgetary limitations, scope, complexity and the nature of goods and/or services.

7. PURPOSE:

Greenwich Public Schools is soliciting bids to provide Life Skills and Related Work at the Milbank School for the Greenwich Public School District.

8. OVERVIEW:

Greenwich Public Schools wishes to solicit Request for Bids for Life Skills and Related Work at the Milbank School, including alternates. Companies must be located within a 100-mile radius of the district in order to submit a bid. It is understood that any contract is subject to available funding.

9. THE DETAILED BIDDER SHALL INCLUDE:

An outline of the procedures to be used to provide Life Skills and Related Work at the Milbank School indicated above, and how cost estimates will be calculated.

10. INTENT OF WORK

Fixed price scope of work per plans and specifications for provision of the Life Skills Room and Related Work at the Milbank School

11. SCOPE OF SERVICE:

Contractor to provide General Construction, Electrical, Plumbing and Mechanical related work to provide Fit -out and related utilities for construction of a new Life Skill Classroom in this existing building.

12. CONTRACTOR AGREEMENT

1. The contractor shall simultaneously with the signing of the Contract, furnish the Town the executed Performance, Maintenance, and Payment Bond of a surety company authorized to do business in the State of Connecticut, and acceptable to the Town, in the sum of the full amount of the Contract Obligation in the form provided by the Town. A PERFORMANCE BOND will not be required where the total estimated cost of labor and materials under the contract with respect to which such general bid is submitted is less than one-hundred thousand dollars (\$100,000.00). Once a contract exceeds \$100,000.00 the bidder will be responsible for obtaining and paying for all bonds required by Greenwich Public Schools.
2. Each bid shall be signed and accompanied by a bid security payable to the Town of Greenwich in the amount of ten (10%) percent of the bid and shall be in the form of a Bid Bond only as issued in the bid documents. Bid Bonds must use the Greenwich Public Schools Bid Bond Form (included within the bid documents), issued by a surety Company listed on the Current U.S. Department

of Treasury's Federal Register and be licensed to underwrite bonds in the State of Connecticut.

3. Each bid shall be accompanied by a completed copy of the Bidders Qualification Questionnaire included in the bid documents. The Greenwich Public Schools reserve the right to request further information and/or supplemental information with respect to the Qualification Questionnaire at their sole discretion
4. Each bidder shall utilize the specified manufacturers. Should the Contractor desire to substitute other articles, materials, apparatus, products or process, then those specified or approved as equal, the Contractor shall apply to the Architect, in writing, for approval of such substitution, per Section 01600 Product Requirements. It should be noted that the Bid shall not be based on a substituted article, material, apparatus, product or process. No substitution reviews shall take place prior to bid.
5. Each form of bid contains a section for alternates and/or unit prices. All alternate prices must be completed with a dollar value. Blanks, not applicable (n/a), no effect, etc. in these portions of the form of bid shall be construed to indicate that the particular alternate shall be performed without increase to the contract price as they relate to the scope of the trade package.
6. Unit prices which do not affect the work of your trade may be filled in "not applicable (n/a)". "Not applicable or blanks in these portions of the form of bid shall be construed to indicate that the unit price is not applicable as they relate to the scope of the trade package.
7. The successful bidder will produce for the Greenwich Public Schools review a current financial statement, which will remain strictly confidential.

#### EXCEPTIONS.

8. Each bid shall be accompanied by a completely filled in and properly executed Non-Collusion Affidavit.
9. All work shall be done in accordance with applicable State statutes; conditions of Prevailing Wages shall apply.
10. Note: Failure to submit a bid with four copies does not constitute a material defect.
11. No Bidder may withdraw their Bid within 90 days after the actual date of Bid Opening.
12. Qualifications to the bid are not allowed. If bids are qualified, they may be deemed non-responsive and subsequently rejected.
13. If there is a conflict between the Contract Agreement and the General Conditions, the Contract Agreement shall prevail.
14. Bid awards must be approved by the Greenwich Public Schools. All contractors shall be required to execute the Greenwich Public Schools standard

form of contract and accompanying payment and performance bonds without exception.

- i. The contract shall be awarded to the lowest responsible and qualified bidder, meaning the bidder whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary to faithful performance of the work based on objective criteria considering past performance and financial responsibility. In considering past performance, the Greenwich Public Schools shall evaluate the skill, ability and integrity of bidders in terms of the bidders' fulfillment of contract obligations and of the bidders' experience or lack of experience with projects of similar size and scope. The Greenwich Public Schools reserves the right to consider as unqualified to do the work required by the bid documents any bidder that does not habitually perform with its own forces the major portion of the work involved in the bid documents. No contract will be awarded to any bidder who is at time of award not qualified under applicable regulations issued by the Secretary of Labor, United States Department of Labor or any applicable State and local laws and regulations.
- ii. After review of all factors, terms, and conditions, including price, the Greenwich Public Schools reserves the right to reject any and all bids, or any part thereof, or waive defects in same.

13. FEE:

Indicate your Bid Fee for all services as described in Part 5. The District reserves the right to provide payment in accordance with completion of services based on the Project Schedule.

14. QUESTIONS:

Questions concerning this Bid will be received by e-mail only directed to the Bid Department at: ([bid\\_department@greenwich.k12.ct.us](mailto:bid_department@greenwich.k12.ct.us)). In the subject line you must put Bid #2406-23 Project Description. All questions must be received no later than noon March 3, 2023. All answers will be posted as an addendum to our website, [www.greenwickschools.org](http://www.greenwickschools.org) no later than noon on March 8, 2023. Failure to comply with these conditions will result in the proposer waving his/her right to dispute the Bid specifications and conditions. It is the proposer's responsibility to check our website for all addenda up to the day before the opening date. Failure to comply with these conditions will result in the bidder waiving his right to dispute the bid specifications and conditions.

15. BID DOCUMENTS:

Specifications can be viewed at the Greenwich Public Schools website: [www.greenwickschools.org](http://www.greenwickschools.org).

Project Description:

This project involves Life Skills and Related Work at the Milbank School for interior fit out and related utilities.

**Pre-Bid Conference**

There will be a pre-bid conference beginning at 3:45 p.m. on February 23, 2023 at the **Milbank School Main entrance**, Greenwich, CT 06878.

**Attendance at the walkthrough is mandatory.** Following the conference, interested parties may walk the at the project and site.

16. ACCEPTANCE:

The department will make determination of the acceptability of work. Work shall be completed in a responsive and professional manner and in accordance with the specifications.

17. GENERAL TERMS AND CONDITIONS:

The Board of Education reserves the right to waive any informality in the bid or reject any or all bids or to accept any bid, which appears to be in the best interest of the Board. Any bid may be withdrawn prior to the opening time and date. Any bid received after the time and date as specified will not be considered.

The Board of Education may consider proximity of vendor's service as a factor in determining lowest responsible bid.

If the Board of Education deems it necessary, the Board of Education may postpone the date for the opening of these bids by notifying each bidder by telephone, mail or the issuing of an addendum through our website.

The Board of Education shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the Board of Education with information and data for this purpose as the Board of Education may request. The right is reserved to reject any bid where, on investigation, the evidence or information submitted by such bidders does not satisfy the Board of Education that the bidder is qualified to carry out properly the terms of the contract.

Consumption or use of alcohol and/or drugs is prohibited on school property. Any individual with alcohol or drugs will be removed from said property. Smoking is prohibited in all school buildings and on school grounds.

18. TAX:

No amount shall be added for the Connecticut Sales Tax or Federal Tax. The Greenwich Public School system is exempt from the payment of taxes imposed by the Federal Government and/or State of Connecticut. Taxes must not be included in the bid price.

19. Non-Connecticut Contractors.

Pursuant to Connecticut General Statutes §12-430(7), as amended by Public Act No. 11-61, Section 66 a nonresident contractor shall comply with the State of Connecticut's bonding requirements.

20. COLLUSION AMONG BIDDERS:

More than one offer from an individual, firm, partnership, corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder is interested in more than one bid for the work contemplated will cause rejection of all bids in which the bidder is interested. Any or all bidders will be rejected if there is any reason for believing that collusion exists among the bidders.

Participants in such collusion may not be considered in future offers for the same work. Each bidder, by submitting a bid, certifies that it is not a part to any collusive action.

21. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED:

The successful bidder will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The successful bidder agrees to post in a conspicuous place, available to employees and applicants for employment, notices setting forth the provision of this nondiscrimination clause. The successful bidder in all solicitation or advertisements for employees, placed by or on behalf of the contractor, will state that such successful Bidder is an Equal Opportunity Employer.

Notices, advertisements, and solicitations placed in accordance with Federal Law, rules or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

22. The intention of this BID/RFP is to establish a contract with one or more contractors who will, upon request, provide the time with the services, labor, and supplies described in this solicitation.

This is no guarantee as to the amount of services, labor or supplies that the Board of Education may purchase during the term of this contract.

23. Per Connecticut General Statutes CGS § 10-221d, which went into effect July 1, 2016, and 10-222c, all people who are entering into a paid agreement with a school district must submit to a mandatory background check. If you are an individual, you must send me your employment history so that I can do the background check. If you are a company having multiple employees in the schools, you will be responsible for obtaining the background checks on each of your employees.

24. The appropriation of funds for this project is contingent upon budget approval.



FULLER AND D'ANGELO P.C.

ARCHITECTS AND PLANNERS

45 KNOLLWOOD ROAD  
TEL: 914.592.4444

ELMSFORD, NEW YORK 10523  
FAX: 914.592.1717

REQUEST FOR INFORMATION NO. \_\_\_\_\_

Greenwich Public Schools  
Life Skills and Related Work at the Milbank School Project

Date: \_\_\_\_\_

A/E Project Number: 22448.00  
Bid # 2406-23

To: Greenwich Public Schools

Email: [bid\\_department@greenwich.k12.ct.us](mailto:bid_department@greenwich.k12.ct.us)

From: \_\_\_\_\_ Tele. No.: \_\_\_\_\_ Fax: \_\_\_\_\_

Subject	Discipline/Trade	Dwg./Spec. Reference

QUESTION:

Field Condition  
Drawing/Spec  
Discrepancy  
Owner Change  
Clarification  
Other

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

FULLER AND D'ANGELO, P.C. RESPONSE

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

CC: Company Name	Contact Name	Copies	Fax Number	Notes

Review and any responses to this request for information by the architect/engineer is strictly for design intent only and does not constitute acknowledgement or acceptance of any cost or schedule implications unless specifically presented by the contractor. By submission of this request for information the contractor assumes all responsibility in the absence of an approved change order or work directive

FULLER AND D'ANGELO, P.C.  
ARCHITECTS AND PLANNERS

## **Information to Bidders Part 2**

### **GENERAL TERMS AND CONDITIONS**

The Board of Education reserves the right to waive any informality in the bid or reject any or all bids or to accept any bid that appears to be in the best interest of the Board. Any bid may be withdrawn prior to the opening time and date. Any bid received after the time and date as specified will not be considered.

The Board of Education will consider proximity of vendor's service as a factor in determining lowest responsible bid. The bidders company must be within a one hundred (100) mile radius of the Greenwich Board of Education.

If the Board of Education deems it necessary, the Board of Education may postpone the date for the opening of this bid by notifying each bidder by telephone, mail or the issuing of an addendum.

The Board of Education shall have the right to take such steps as it deems necessary to determine the ability of the bidders to perform the work and the bidders shall furnish the Board of Education with information and data for this purpose as the Board of Education may request. The right is reserved to reject any bid where, on investigation, the evidence or information submitted by such bidders does not satisfy the Board of Education that the bidders is qualified to carry out properly the terms of the contract.

Consumption or use of alcohol and/or drugs is prohibited on School Property. Any individual with alcohol or drugs will be removed from said property. Smoking is prohibited in all School Buildings and on school grounds.

## **INSURANCE PROCEDURE**

### **PLEASE NOTE:**

**THIS PAGE MUST BE RETURNED WITH YOUR BID/RFP. FAILURE TO DO SO MAY RESULT IN YOUR BID/RFP BEING REJECTED.**

Please take the insurance requirements of the Contract to your agent/broker immediately upon receipt of the bid documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in this Request for BID/RFP. Any BID/RFP with deficient insurance requirements will be rejected.

### **STATEMENT OF VENDOR:**

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. The BID/RFP cost reflects any additional costs relating to insurance requirements for this work.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

### **Insurance Requirement Sheet**

**Insurance Requirements:** Before starting and until final completion and acceptance of the work called for in the Contract and expiration of the guarantee period provided for in the Contract, the Contractor and its subcontractors, if any, shall procure and maintain insurance of the types and amounts checked in paragraphs A through F below for all Contract operations.

- ☒ A. General Liability, with minimum coverages for combined bodily injury and property damage liability of \$2,000,000 general aggregate, \$1,000,000 per occurrence including:
  - ☒ 1. Commercial General Liability.
  - ☒ 2. Town as additional insured.
  - ☐ 3. Owners and Contractors Protective Liability (separate policy in the name of the Town).
- ☒ B. Comprehensive Automobile Liability, with minimum coverages of \$1,000,000 combined single limit for bodily injury and property damage, including, where applicable, coverage for any vehicle, all owned vehicles, scheduled vehicles, hired vehicles, non-owned vehicles and garage liability.
- ☒ C. Excess Liability, with minimum coverage of \$5,000,000 in umbrella form, or such other form as approved by Town Department Head and Risk Management Director.
- ☒ D. Workers' Compensation and Employer's Liability, with minimum coverages as provided by Connecticut State Statutes.

- ☐ E. **Professional Liability (for design and other professionals for Errors and Omissions), with minimum coverage of \$1,000,000. If the policy is on a claims-made basis, coverage shall be continually renewed or extended for three (3) years after work is completed under the Contract.**
- ☐ F. **Other (Builder's Risk, etc.):\_\_\_\_\_.**
- ☒ G. **CERTIFICATE HOLDER: TOWN OF GREENWICH  
ATTN: BOARD OF EDUCATION. (Also fill in on ACORD Certificate of Insurance)  
290 Greenwich Avenue, Greenwich, CT 06830.**

The **Acord certificate of insurance form** must be executed by your insurance agent/broker and returned to this office. Company name and address must conform on all documents including insurance documentation. It is required that the agent/broker note the individual insurance companies providing coverage, rather than the insurance group, on the Acord form. The Contract number (provided to the awarded Contractor), project name and a brief description must be inserted in the "Description of Operations" field. It must be confirmed on the Acord Form that the Town of Greenwich and Greenwich Public School are endorsed as an additional insured by having the appropriate box checked off and stating such in the "Description of Operations" field. **A letter from the awarded vendor's agent/broker certifying that the Town of Greenwich, Greenwich Public School and Fuller and D'Angelo P.C. are endorsed onto the general liability policy as an additional insured is also mandatory.** This letter **must follow exactly the format provided by the Purchasing Department and must be signed by the same individual authorized representative who signed the Acord form.** If the insurance coverage required is provided on more than one Acord certificate of insurance, then additional endorsement letters are also required. Contract development will begin upon receipt of complete, correct insurance documentation.

The Contractor shall be responsible for maintaining the above insurance coverages in force to secure all of the Contractor's obligations under the Contract with an insurance company or companies with an AM Best Rating of A or better, licensed to write such insurance in Connecticut and acceptable to the Risk Manager, Town of Greenwich. For excess liability only, non-admitted insurers are acceptable, provided they are permitted to do business through Connecticut excess line brokers per listing on the current list of Licensed Insurance Companies, Approved Reinsurers, Surplus Lines Insurers and Risk Retention Groups  
Issued by the State of Connecticut Insurance Department.



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A.C. No. Ex):	FAX (A.C. No.):
INSURED	E-MAIL ADDRESS:	
	PRODUCER CUSTOMER ID #:	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A:	NAIC #
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

**COVERAGES**

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	<b>GENERAL LIABILITY</b>						
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE \$
	<input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence) \$
							MED EXP (Any one person) \$
							PERSONAL & ADV INJURY \$
							GENERAL AGGREGATE \$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG \$
	<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						\$
	<b>AUTOMOBILE LIABILITY</b>						
	<input type="checkbox"/> ANY AUTO						COMBINED SINGLE LIMIT (Ea accident) \$
	<input type="checkbox"/> ALL OWNED AUTOS						BODILY INJURY (Per person) \$
	<input type="checkbox"/> SCHEDULED AUTOS						BODILY INJURY (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS						PROPERTY DAMAGE (Per accident) \$
	<input type="checkbox"/> NON-OWNED AUTOS						\$
							\$
	<b>UMBRELLA LIAB</b>	<input type="checkbox"/> OCCUR					EACH OCCURRENCE \$
	<b>EXCESS LIAB</b>	<input type="checkbox"/> CLAIMS-MADE					AGGREGATE \$
	<input type="checkbox"/> DEDUCTIBLE						\$
	<input type="checkbox"/> RETENTION \$						\$
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b>						
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	<input type="checkbox"/> Y / <input type="checkbox"/> N	N/A				WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER <input type="checkbox"/>
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. EACH ACCIDENT \$
							E.L. DISEASE - EA EMPLOYEE \$
							E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

**CERTIFICATE HOLDER****CANCELLATION**

	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

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ACORD 25 (2009/09)

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**REFERENCES:**

Please list at least five (5) school projects in Connecticut or New York of similar size, scope and complexity to Greenwich Public Schools work where you or your company has performed these services.

1. \_\_\_\_\_  
NAME AND ADDRESS

\_\_\_\_\_  
EMAIL

\_\_\_\_\_  
CONTACT PERSON

\_\_\_\_\_  
TELEPHONE NUMBER

2. \_\_\_\_\_  
NAME AND ADDRESS

\_\_\_\_\_  
EMAIL

\_\_\_\_\_  
CONTACT PERSON

\_\_\_\_\_  
TELEPHONE NUMBER

3. \_\_\_\_\_  
NAME AND ADDRESS

\_\_\_\_\_  
EMAIL

\_\_\_\_\_  
CONTACT PERSON

\_\_\_\_\_  
TELEPHONE NUMBER

4. \_\_\_\_\_  
NAME AND ADDRESS

\_\_\_\_\_  
EMAIL

\_\_\_\_\_  
CONTACT PERSON

\_\_\_\_\_  
TELEPHONE NUMBER

5. \_\_\_\_\_  
NAME AND ADDRESS

\_\_\_\_\_  
EMAIL

\_\_\_\_\_  
CONTACT PERSON

\_\_\_\_\_  
TELEPHONE NUMBER



GREENWICH PUBLIC SCHOOLS  
MILBANK SCHOOL  
LIFE SKILLS CLASSROOM & RELATED ITEMS  
LIST OF DRAWING SHEETS

**SECTION 00 0115**  
**LIST OF DRAWING SHEETS**

**PART 1 - GENERAL**

**1.1 DRAWING INDEX**

- A. Drawings are listed on Drawing G-1.

**PART 2 - PRODUCTS (NOR USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 00 2113**  
**INSTRUCTIONS TO BIDDERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Refer to the Invitation to Bids, Information to Bidders and the Agreement for additional information. Any conflicts the Invitation to Bids, Information to Bidders and the Agreement shall supercede this Section.

**1.3 DOCUMENT INCLUDES**

- A. Invitation
  - 1. Bid Submission
  - 2. Intent
- B. Bid Documents and Contract Documents
  - 1. Definitions
  - 2. Contract Documents Identification
  - 3. Availability
  - 4. Examination
  - 5. Inquiries/Addenda
  - 6. Product/Assembly/System Substitutions
- C. Site Assessment
  - 1. Prebid Conference
- D. Qualifications
  - 1. Qualifications
- E. Bid Submission
  - 1. Bid Depository
  - 2. Submission Procedure
  - 3. Bid Ineligibility
- F. Bid Enclosures/Requirements
  - 1. Security Deposit
  - 2. Consent of Surety
  - 3. Performance Assurance
  - 4. Bid Form Requirements
  - 5. Bid Form Signature
  - 6. Additional Bid Information
  - 7. Selection and Award of Alternates
- G. Offer Acceptance/Rejection
  - 1. Duration of Offer
  - 2. Acceptance of Offer

**1.4 RELATED DOCUMENTS**

- A. Division 00 Procurement Requirements and Greenwich Public Schools Front End documents as listed in the Table of Contents.
- B. Division 01 General Requirements including:
  - 1. Document 01 1000 - Summary of Contract.

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2. Document 00 4100 - Bid Form.
3. Section 00 4400 - Contractor's Qualification Statement.
4. Document 00 7300 - Supplementary Conditions.
5. Section 01 2100 - Allowances.

**1.5 BID SUBMISSION**

- A. Refer to Invitation to Bids for date and time.
- B. Offers submitted after the stated time shall be returned to the bidder unopened.
- C. Offers will be opened publicly immediately after the time for receipt of bids.

**1.6 INTENT**

- A. The intent of this General Contracting Bid is to request and obtain an offer to perform work to complete the Life Skill Classroom and Related Work at Milbank School located within the Greenwich Public Schools for a Stipulated Sum in accordance with the Contract Document.

**1.7 LUMP SUM BIDS**

- A. Bids will be received for one (1) prime contracts as follows:
  1. General Construction

**1.8 WORK IDENTIFIED IN THE CONTRACT DOCUMENTS**

- A. Work of this proposed Contract comprises the Life Skill Classroom and Related Work as indicated on drawings and specification.

**1.9 CONTRACT TIME**

- A. The Contractor shall complete its portion of the Project work within such Contract Time as will assure the substantial completion of the Project by all contracts, in accordance with the sequence of work described in Section 01 1000 - Summary of Contract and Section 01 1010 - Milestone Schedule. The attention of the bidders is specifically directed to the provisions of the Agreement and that on no account will the contractor be permitted to assert a claim for damages for delay.

**1.10 BID DOCUMENTS AND CONTRACT DOCUMENTS**

- A. Definitions: All definitions set forth in the Agreement and Section 01 1000 - Summary of Contract are applicable to these Instructions to Bidders.
- B. Contract Documents: Defined in the Agreement including issued Addenda .
- C. Bid, Offer, or Bidding: Act of submitting an offer under seal.
- D. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

**1.11 CONTRACT DOCUMENTS IDENTIFICATION**

- A. The Contract Documents are identified as F+D Project Number 22487.00, as prepared by Fuller and D'Angelo, P.C. who is located at 45 Knollwood Road, Elmsford, New York 10523, and with contents as identified in the Table of Contents.

**1.12 AVAILABILITY**

- A. Contract documents can be viewed and downloaded from the Greenwich Public Schools website: [www.greenwichschools.org](http://www.greenwichschools.org)
- B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes. Download Documents for Bidding.

**1.13 EXAMINATION**

- A. Bid Documents are on display at the offices of the following:
  1. Bid Documents can be viewed and downloaded from the Greenwich Public Schools website: [www.greenwichschools.org](http://www.greenwichschools.org).

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INSTRUCTIONS TO BIDDERS

- B. Upon receipt of Bid Documents verify that documents are complete. Notify Eugene Watts Greenwich Public Schools Purchasing Dept. should the documents be incomplete, see e.mail address below.
- C. Immediately notify Eugene Watts Greenwich Public Schools Purchasing Dept. upon finding discrepancies or omissions in the Bid Documents.

**1.14 INQUIRIES/ADDENDA**

- A. Addenda are written or graphic instruments issued prior to the Bid Date which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed
- B. Verbal answers are not binding on any party.
- C. Clarifications requested by bidders must be in writing **not later than March 3, 2023 at Noon**. The reply will be in the form of an Addendum, if required, a copy of which will be posted on the Website by: **March 8, 2023 by Noon**, other addendum may be posted to within 24 hours of bid time.
- D. Questions: Any and all questions about the interpretation or clarification of the Bid Documents, or about any other matter affecting the Work or pertaining to the bid must be directed in writing to:  
**Bid\_Department@greenwich.k12.ct.us - In the subject line put Bid Number 2406-23**  
**Attn: Mr. Eugene Watts**
- E. Answers: The Owner will issue addenda, if necessary, to answer such questions. Bidders shall rely on answers contained in such addenda and shall not rely upon any oral answers given by any employee or agent of the Owner's Representative, Architect, and Architect's Consultants

**1.15 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS**

- A. Where the Bid Documents stipulate a particular product bidders shall comply with the specifications, performance and quality of the specification item. The Architect will not review any substitutions during the bidding period. The bidder assumes all responsibility to meet the requirements and the Architect shall be final authority as to a product is equal to the specification.
- B. Wherever in the Contract Documents an article, material, apparatus, product or process is identified by "Basis of Design", trade name or catalog reference, or by the name of the patentee, manufacturer or dealer, it is understood that it constitutes the standard requirement to meet the contract specifications. All other products shall be considered as "substitutions" and shall be submitted in accordance to Section 01 2500 - Substitution Procedures.
- C. Where two or more articles, materials, apparatus, products or processes are listed as acceptable by reference to trade name or otherwise, the choice of these will be optional to the bidder. All other products these shall be considered as "substitutions" and shall be submitted in accordance to Section 01 2500 - Substitution Procedures.
- D. Where articles, materials, apparatus, products or processes are listed by reference to a named specified item as "or Equal", these shall be considered as "substitutions" and shall be submitted in accordance to Section 01 2500 - Substitution Procedures.
- E. Bidders may base their bid on a product they may consider equal to the specified product. These shall be considered as "substitutions" and shall be submitted in accordance to Section 01 2500 - Substitution Procedures.
- F. The bidder is made aware that the Owner's Representative and Architect will make the final determination as to what constitutes an equal.
- G. If the Architect shall reject the proposed equal as not being the equal of that specifically named in the contract, the successful Contractor shall immediately proceed to furnish the designated article, material, apparatus, product or process specified or an approved equal without additional cost or time delay to the Owner.
- H. See Section 01 6000 - Product Requirements for additional requirements.

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INSTRUCTIONS TO BIDDERS

- I. Where the Bid documents stipulate a particular product bidders shall comply with the specifications, and performance and quality of the specification item. The architect will not review any substitutions during the bidding period. The bidder assumes the responsibility to meet the requirements and the architect shall be the final authority as to a product is an equal to the specification.

**1.16 PREBID CONFERENCE**

- A. A mandatory bidders conference has been scheduled for 3:45 **p.m. on the 23rd day of February** at the location of Milbank School Main Lobby.
- B. Attendance is Mandatory.
- C. Representatives of Fuller and D'Angelo, P.C. will be in attendance.
- D. If applicable, information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

**1.17 EVIDENCE OF QUALIFICATIONS**

- A. Contractors whose bid exceeds \$500,000.00 shall hold a current "DAS Contractor Prequalification Certificate" (not a pre-determination letter) from the Department of Administrative Services of the State of Connecticut according to Public Act 03-215 and as amended by Public Act 04-141. These Bidders shall submit with their bids a "DAS Contractor Prequalification Certificate" along with a current "Update (bid) Statement." Failure to submit these items with the bid will result in disqualification of the bidder per the Public Act. If you have any questions regarding these requirements, contact the State of CT DAS at telephone number (860) 713-5280 or visit their web site at [www.das.state.ct.us](http://www.das.state.ct.us)
- B. **Bidder shall submit with their bid proposal** a properly executed Contractor's Qualification Statement in Section 00 4400.
- C. To be considered qualified, in addition to the qualifications listed in the Contractor's Qualification Statement Section 00 4400, bidder must demonstrate to the Owner's satisfaction:
  1. The Corporation, partnership, sole proprietorship or principals of the entity in whose name the bid is submitted has no less than the previous five (5) years performing or coordinating the Work which they are bidding on.
  2. The Bidder has to have performed five (3) similar projects.
  3. The principal(s) of the bidder have satisfactorily completed no less than five (5) projects of comparable size and type to this project, and not less than a cost of \$500,000.
  4. The bidder is not currently involved in bankruptcy proceedings.
  5. The bidder is capable of and intends and intends to perform the work with a minimum of 50% with its own forces.
  6. The bidder will perform the work with sufficient personnel as required to comply with the schedule.
  7. The bidder or principals of the bidder and each subcontractor must have a minimum of five (5) years experience in the work and/or applicable trade.
  8. The Field Superintendent must have at least five (5) years as a working field superintendent and must speak English.
  9. All bidders will be required to submit a listing of projects, including addresses, Owner's name, Architect, date work was performed and any other information which would serve to document its ability to perform the work of the character desired and in time required.

**1.18 SUBCONTRACTORS/SUPPLIERS/OTHERS**

- A. Greenwich Public Schools reserves the right to reject a proposed subcontractor for reasonable cause.
- B. Refer to Agreement

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- C. All proposed sub-contractors must be submitted to Owner's Representative, Architect, and Construction Manager for approval.

**1.19 BID SUBMISSION PROCEDURE**

- A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed. Refer to Invitation to Bid and Information to Bidder.
- B. Submit one (1) original and four (4) copies of the executed offer on the Bid Forms provided in the project manual, signed and sealed with the required security in a closed opaque envelope, clearly identified with bidder's name and:
  - Greenwich Public Schools Bid No. 2406-23.
  - Milbank School
  - Life Skill Classroom and Related Work
- C. Improperly completed information, irregularities in security deposit, may be cause not to open the Bid Form envelope and declare the bid invalid or informal.
- D. To submit a bid for a bid package, the bidder should photo copy or remove the proposal form for that bid package from the Project Manual. Then the bidder should complete, sign and submit the form as required herein. If a bidder is bidding on more than one bid package, there must be on fully completed and signed form for each package being bid. The bidder should not submit the entire Project Manual with the bid proposal.
- E. All bid prices shall be filled in, both in words and figures. Signatures shall be in ink and in longhand. Proposals which are incomplete, conditional or obscure may be rejected as informal.
  - 1. In case of a discrepancy between the words and figures, the written word, not the figures, will govern.
- F. Bidder's shall not rely on oral statements made by any employee or agent of the Owner, Architect, Architect's consultants or Owner's Representative. Before submitting a proposal, bidders shall fully inform themselves as to all existing conditions and limitations and shall include in the Proposal a sum to cover the cost of all items included in the Contract
- G. No oral or telephonic proposals or modifications of proposals will be considered.

**1.20 BID INELIGIBILITY**

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Greenwich Public Schools, be declared unacceptable.
- B. Bid Forms, Appendices, and enclosures that are improperly prepared may, at the discretion of Greenwich Public Schools, be declared unacceptable.
- C. Failure to provide security deposit, bonding or insurance requirements may, at the discretion of Greenwich Public Schools, invalidate the bid.

**1.21 SECURITY DEPOSIT**

- A. Bids shall be accompanied by a security deposit as follows:
  - 1. Bid Bond or Certified Check of a sum no less than 10 percent of the Bid Amount , including allowances, unit costs, and alternates.
- B. Endorse the Bid Bond or Certified Check in the name of the Greenwich Public Schools as obligee, signed and sealed by the principal (Contractor) and surety.
- C. The security deposit(s) will be returned after delivery to the Greenwich Public Schools of the required Performance and Payment Bond(s) by the accepted bidder.
- D. Include the cost of bid security in the Bid Amount.
- E. If no contract is awarded, all security deposits will be returned.

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**1.22 CONSENT OF SURETY**

- A. Submit with the Bid: The attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power.

**1.23 PERFORMANCE ASSURANCE**

- A. Accepted Bidder: Shall provide a Performance and Payment bond, as described in Intro Letter and Information to Bidders Part 1, Article 12 prior to the execution of the Contract, the bidder to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in such form and amount as the Owner may prescribe and with such sureties secured through the bidder's usual sources as may be agreeable to the parties.
- B. Include the cost of performance assurance bonds in the Bid Amount.
- C. The bidder shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power

**1.24 INSURANCE**

- A. There are special insurance requirements on this project. Refer to Greenwich Front End Documents for a summary description of the required coverages. The Owner reserves the right to refuse the award of a Contract to any apparent low bidder who fails to provide the specified insurance certificates at the required time.
  - 1. The Owner, Architect and Construction Manager shall be listed as "Additionally Insured" on all applicable Insurance policies.

**1.25 BID FORM REQUIREMENTS**

- A. Complete all requested information in the Bid Form, Supplements to Bid and Appendices.

**1.26 SALES AND USE TAXES**

- A. The Owner is a tax exempt entity, so there shall be no charge for sales or use taxes. The Owner will document this status as requested.

**1.27 FEES FOR CHANGES IN THE WORK**

- A. Refer to the Agreement.

**1.28 BID FORM SIGNATURE**

- A. The Bid Form shall be signed by the bidder, as follows:
  - 1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
  - 2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
  - 3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.
  - 4. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

**1.29 NONDISCRIMINATION**

- A. All Contractors and Subcontractors of all tiers and all vendors shall comply with all pertinent provisions of the State, Local and Federal law against discrimination in employment practices. Refer to Agreement.

**1.30 PREVAILING WAGES**

- A. Connecticut State law requires the payment of prevailing wages on the project, as listed in the Project Manual. (Wage Rates Attached)

**1.31 ADDITIONAL BID INFORMATION**

- A. Submit the following Supplements concurrent with bid submission:
  - 1. Refer to Greenwich Front End Documents for additional requirements.
  - 2. Document 01 2300- Alternates
  - 3. Section 00 4401 - Qualification of Bidders
  - 4. Section 01 2100 - Allowances
- B. The bidder by making his bid represents that he has read and understands the bidding documents.
- C. The bidder by making his bid represents that he has visited the site and familiarized himself with the local conditions under which the work is to be performed. Visits to the site shall be arranged through the Architect

**1.32 SELECTION AND AWARD OF ALTERNATES**

- A. Indicate variation of bid price for alternatives listed on Bid Form and Section 01 2300. Unless otherwise indicated, indicate alternatives as a difference in bid price by adding to or deducting from the base bid price. Follow other directions on Bid Form.
- B. Bids will be evaluated on the total of the base bid price and select alternatives based on the Owners, choice and prevue to complete the work scope they select to be performed.

**1.33 DURATION OF OFFER**

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of 90 days after the bid closing date.

**1.34 ACCEPTANCE OF OFFER**

- A. Greenwich Public Schools reserves the right to accept or reject any or all offers.
- B. The bidder acknowledges the right of the Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of the Owner, at its discretion to reject a bid if the bidder fails to furnish any required bid security, or to submit the information required by the bidding documents, including Section 00 4400 - Contractor's Qualification Statement or if the bid is incomplete or irregular.

**1.35 POST-BID PROCEDURE**

- A. The bid proposal, alternates, unit costs, with the proposed subcontractor(s), the Contractor's Qualification Statement, Information received from owners of other projects all will be considered to determine whether the contractor is the "lowest responsible bidder" in making the award by Greenwich. The Owner and Architect may make such investigation as the Owner deems necessary to determine the responsibility of any bidder or to determine the ability of any bidder to perform the Work. Such investigation shall begin with a review of the Contractor's Qualification Statement (Section 00 4400) and shall include such additional information as shall be required herein, or requested afterward.
- B. The successful bidder will produce for the Greenwich Public Schools review a current financial statement, which will remain strictly confidential, NO EXCEPTIONS. Refer to Information to Bidders.

**END OF SECTION**

**SECTION 00 4100  
BID FORM**

**THE PROJECT AND THE PARTIES**

**TO:**

Greenwich Public Schools  
Purchasing Department, Havermeyer Building  
290 Greewnich Avenue  
Greenwich CT 06830  
Attention Eugene H. Watts, Sr. Buyer  
Voice: 203.625.7411

**FOR:**

Life Skill Classroom and Related Work  
Milbank School  
Greenwich Public Schools Bid # 2406-23

**BID OPENING DATE: March 16, 2023 AT 11:00 AM.**

**SUBMITTED BY:** \_\_\_\_\_  
Bidder's Full Name \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Phone # : \_\_\_\_\_ Contact Name: \_\_\_\_\_

**1.1 OFFER**

- A. Having examined the Place of The Work and all matters referred to in the Bidding Requirements and the Contract Documents prepared by Fuller and D'Angelo, P.C. for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform Life Skill Classroom and Related Work for the Sums of:
1. BASE BID - LIFE SKILLS ROOM AND RELATED WORK
    - a. The Base Bid of this Proposal for all work required by the Contract Documents for the Life Skill Classroom and Related Work is as follows:  
\_\_\_\_\_  
(\$ \_\_\_\_\_) DOLLARS
  2. CASH ALLOWANCES
    - a. The total Cash Allowance as indicated in Section 01 2100 - Allowances is as follows:  
Twenty Thousand \_\_\_\_\_ (\$20,000.00) DOLLARS
- B. TOTAL BASE BID
1. The Total Base Bid of this Proposal for all work required by the Contract Documents for Life Skill Classroom and Related Work and Related Work is as follows:  
\_\_\_\_\_  
(\$ \_\_\_\_\_) DOLLARS
- (The Total Base Bid is sum of 1.1.A.1.a and 1.1.A.2.a)
- C. The undersigned further understands and agrees that he is to furnish and provide all the necessary material, machinery, plant, implements, tools, labor, services, skill and other items of whatever nature

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required, and to do and perform all the work necessary under the Contract, to complete the work in accordance with the drawings and specifications and any addenda thereto, and to accept in full compensation therefore the amount of the Total Bid stated, modified by such additive- or deductive alternatives, if any as are accepted by the Owner.

- D. We have included the required security Bid Bond as required.
- E. We have included the cost for the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.
- F. All applicable federal taxes are included and State of Connecticut taxes are included in the Bid Sum.

**1.2 ALTERNATES**

- A. The Alternates for this Proposal required by the Contract Documents are listed in Section 01 2300.
- B. **Alternate No. 1 - Replace/relocate Boiler Room Electrical Panel:**
  - 1. The Contractor for the above work shall state the combined amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Replace/relocate the Boiler Room Electrical Panel in accordance with Contract documents.  
\_\_\_\_\_ (\$ \_\_\_\_\_) DOLLARS
- C. **Alternate No. 2 -Replace Utility Pole on Property**
  - 1. The Contractor for the above work shall state the combined amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Replace utility Pole on property in accordance with Contract Documents.  
\_\_\_\_\_ (\$ \_\_\_\_\_) DOLLARS
- D. **Alternate No. 3 - Furnish and Install new instantaneous HWH and associated power, vent and piping.:**
  - 1. The Contractor for the above work shall state the amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Furnish and Install new instantaneous HWH and associated power, vent and piping. in accordance with the Contract Documents  
\_\_\_\_\_ (\$ \_\_\_\_\_) DOLLARS

**1.3 ACCEPTANCE**

- A. This offer shall be open to acceptance and is irrevocable for ninety (90) days from the bid closing date.
- B. If this bid is accepted by Greenwich Public Schools within the time period stated above, we will:
  - 1. Execute the Agreement within seven days of receipt of Notice of Award.
  - 2. Furnish the required bonds within seven days of receipt of Notice of Award.
  - 3. Failure to do so will constitute a breach of contract and Greenwich will have the right to terminate the contract agreement, and bid as this is a time sensitive and of time is of the essence project.
- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Greenwich Public Schools by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

**1.4 REJECTION OF BIDS**

- A. The undersigned agrees that the Owner shall have the right to accept or reject any or all bids

**1.5 CONTRACT TIME**

- A. If this Bid is accepted, we will:  
Complete all the work covered by this Proposal with a commencement date of NO EARLIER THAN **Letter of Award** by Owner. Work shall be as indicated in 01 1000 SUMMARY OF CONTRACTS Failure to complete each phase of work by dates indicated will result in liquidated damages as stated in the Agreement.

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**1.6 ADDENDA**

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
1. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.
  2. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.
  3. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.
  4. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.
  5. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

**1.7 BID FORM SUPPLEMENTS**

- A. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
1. Refer to Greenwich Front End Documents for additional requirements.
  2. Section 01 2300 - ALTERNATES - : Include the cost variations to the Bid Sum applicable to the Work as described in this Section .
  3. Section 00 4401 - Qualification of Bidders.
  4. Section 01 2100 - Allowances.

**1.8 BIDDER'S FURTHER AFFIRMATION AND DECLARATION**

- A. The above name bidder and should this bid be a joint bid each party thereto, further affirm and declares:
1. That said bidder is of lawful age and the only one interested in this bid; and that no other person, firm or corporation, except those herein above named, has any interest in this bid or in the contract proposed to be entered into.
  2. That this bid is made without any understanding, agreement or connection with any other person, firm, or corporation making a bid for the same work, and is in all respects fair and without collusion or fraud.
  3. That said bidder is not in arrears to the Greenwich Public Schools upon debt or contract, and is not a defaulter, as surety or otherwise upon any obligation to the said Greenwich Public Schools
  4. That no member of the Greenwich Public Schools or any officer or employee of the Greenwich Public Schools or person whose salary is payable in whole or in part from the said school district treasury, or the spouse of any foregoing is or shall be or become interested, directly or indirectly, as a contracting party, partner, stockholder, surety or otherwise, in this bid, or in the performance of the Contract, or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof.
  5. That he/she has carefully examined the site of the work and that, from his/her own investigations, he/she has satisfied him/herself as to the nature and location of the work, and character, quality and quantity of materials, and all difficulties likely to be encountered, the kind and extent of equipment and other facilities needed for the performance of the work, the general and local conditions, and all other items which may, in any way, affect the work or its performance.
  6. That if a corporation, this bid or proposal containing the Non-Collusive Binding Certification and the foregoing Affirmation and Declaration has been authorized by the Board of Directors of such Corporation, which authorization includes the signing and submission of this bid or proposal and the inclusion therein of the said Certificate of Non-Collusion and Affirmation and Declaration as the Act and Deed of the Corporation.

**1.9 BID FORM SIGNATURE(S)**

\_\_\_\_\_  
Signature Corporate Seal

The Corporate Seal of

Company Name: \_\_\_\_\_

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was hereunto affixed in the presence of:

\_\_\_\_\_  
(Authorized signing officer, Title)

(Seal)

\_\_\_\_\_  
(Authorized signing officer, Title)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

Subscribed and sworn before me the day of \_\_\_\_\_ Month of \_\_\_\_\_ 202\_\_\_\_

Notary Public: \_\_\_\_\_

My Commission Expire: \_\_\_\_\_

**END OF BID FORM**

**SECTION 00 4401**  
**QUALIFICATION OF BIDDERS**

**1.1 REQUIREMENTS**

- A. The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.
- B. Refer to Greenwich Public Schools front end sections for additional information.
- C. Contractor(s) whose bid exceeds \$500,000.00 shall hold a current "DAS" Contractor Prequalification Certificate" (not a predetermination letter) from the Department of Administrative Services of the State of Connecticut according to Connecticut General Statutes Section 4a-100, 4b-101 and 4b-91 previously stated as Public Act 03-215 and as amended by Public Act 04-141. Bidders shall submit with their bids, unless noted otherwise, a "DAS Contractor Prequalification Certificate" along with a current "Update (bid) Statement". Failure to submit those items with the bid will result in disqualification of the bidder. If you have any questions regarding these requirements contact the State of CT. DAS, at telephone number 860-713-5280 or visit their web site at [www.das.state.ct.us](http://www.das.state.ct.us).
- D. With the submittal of the Bid Proposal Form, **the bidder shall attach this Qualification of Bidders** and shall answer all the questions and provide all information requested herein. Failure to answer these questions or provide information requested in full may be cause for rejection of the bidder's proposal. If more space is needed, attach additional sheets with reference to subject paragraph.
- E. The Owner reserves the right to consider, but not limited to, the financial responsibility, experience and reputation in the construction industry, as well as the specific qualifications listed below and elsewhere in this document in considering bids and awarding the contract. The Board of Education reserves the right to waive any informalities if, at its discretion the interest of the Greenwich Public Schools will be better served.
- F. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit written evidence of financial position and current commitments.
- G. Each Company (Bidder) shall have been in existence under the same name for no less than five (5) years.
- H. Each Company (Bidder) shall have a successfully completed three (3) School projects within the last Five (5) years substantially **similar in scope, size, complexity and dollar value** to the work of this project.
- I. The contractor shall furnish, on the attached forms, the two (2) projects of that it has performed during the most recent Five (5) years including, but not limited to, the name and address of the project, the name of the awarding entity/owner, the name of the awarding entity's/owner's representative, construction manager and architect, current telephone numbers where each can be reached, the description of the project, general scope of the contractor's work, contract price, dates of performance, whether the contract was terminated for cause or convenience, whether the contract was completed on time and whether liquidated damages were assessed against the contractor, and if any items above provide a written explanation.
  - 1. The Owner reserves the right to require additional information it deems appropriate concerning the history of the contractor's performance of each such contract.
- J. The final determination of whether the contractor possesses the requisite experience rests in the sole discretion of the Owner.
- K. To be considered qualified, in addition to the items listed in the Qualification of Bidders, bidder must demonstrate to the Owner's satisfaction:
  - 1. The Corporation, partnership, sole proprietorship of the entity in whose name the bid is submitted has no less than the previous Five (5) years performing or coordinating the Work which they are bidding on.
  - 2. The bidder is capable of and intends and intends to perform the work with its own employees in accordance with Article 5.2.5 of the General Conditions.

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3. The bidder is capable of and intends to perform the work with its own employees in accordance with the following:
  - a. Notwithstanding any other provisions of the Contract Documents, General Contractor shall perform at least 40% Forty Percent of the field work by its own employees.
4. The bidder will perform the work with sufficient personnel as required to comply with the schedule.
5. Each subcontractor must have a minimum of five (5) years experience in the work and/or applicable trade. They shall be certified by the Roofing Material Mfg. Co.
6. Field Superintendent must have at least five (5) years experience as a working field superintendent and must speak English or have a translator available at all times at no cost to the Owner.

**1.2 QUESTIONNAIRE:**

Submitted to: Greenwich Public Schools

Address: 290 Greewnich Avenue

City/Town: Greenwich CT 06830

Submitted By: \_\_\_\_\_

Corporation \_\_\_\_\_ Partnership \_\_\_\_\_ Individual \_\_\_\_\_

Address: \_\_\_\_\_

Principal Office: \_\_\_\_\_

Other: \_\_\_\_\_

Name of Project: Life Skill Classroom and Related Work  
Milbank School

Type of Work: (file separate for each Classification of Work)  
General Construction, Plumbing, HVAC, and Electrical and Related Work.

**1.3 ORGANIZATION**

- A. How many years has your organization been in business as a Contractor? \_\_\_\_\_
  1. How many years has your organization been in business under its present business name? \_\_\_\_\_
  2. Under what other or former names has your organization operated?  
\_\_\_\_\_  
\_\_\_\_\_
- B. What is the firm's bonding range?  
Single \_\_\_\_\_  
Aggregate \_\_\_\_\_
- C. If your organization is a corporation, answer the following:
  1. Date of Incorporation: \_\_\_\_\_
    - a. State of Incorporation: \_\_\_\_\_
    - b. President's Name: \_\_\_\_\_
    - c. Vice-president's name(s): \_\_\_\_\_
    - d. Secretary's name: \_\_\_\_\_
    - e. Treasurer's name: \_\_\_\_\_
- D. If your organization is a partnership, answer the following:
  1. Date of organization: \_\_\_\_\_
    - a. Type of partnership (if applicable): \_\_\_\_\_
    - b. Name(s) of general partner(s):  
\_\_\_\_\_  
\_\_\_\_\_

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- E. If your organization is individually owned, answer the following:
1. Date of organization: \_\_\_\_\_
  2. Name of owner: \_\_\_\_\_
- F. If the form of your organization is other than those listed above, describe it and name the principals:
- \_\_\_\_\_
- \_\_\_\_\_

**1.4 OWNERSHIP, MANAGEMENT, AFFILIATION**

- A. Identify each person who is or has been, within the past five years, an owner of 5.0% or more of the firm's shares, one of the five largest shareholders, a director, an officer, a partner or the proprietor, or a managerial employee.

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

- B. Joint Ventures: Provide information for all firms involved. Fill in name, % owned, office held; indicate by Y or N whether director, officer, partner and title

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

First Name: \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_ DOB \_\_\_\_\_

% Owned: \_\_\_\_ Director: Yes \_\_\_\_ No \_\_\_\_ Officer: Yes \_\_\_\_ No \_\_\_\_ Title \_\_\_\_\_ Partner: Yes \_\_\_\_ No \_\_\_\_

- C. Has the firm or any firm listed in response to questions above defaulted or been terminated and its surety called upon to complete, any contract awarded within the past five years Yes \_\_\_\_ No \_\_\_\_ If yes, give date(s), agency (ies)/owner(s), project(s), contract numbers, and describe including the result:
- \_\_\_\_\_
- \_\_\_\_\_

- D. List below any projects performed by the bidder in the past five (5) years on which any of the following events occurred:
1. Were any extension of time were requested by the contractor, Yes \_\_\_\_ No \_\_\_\_ and were such requests granted? Yes \_\_\_\_ No \_\_\_\_
  2. Was litigation and/or arbitration commenced by either the Owner or the bidder as a result of the work of the project performed by the bidder? Yes \_\_\_\_ No \_\_\_\_
  3. Were any liens filed on the project by subcontractors or material suppliers of the bidder? Yes \_\_\_\_ No \_\_\_\_
  4. Did the bidder make any claims for extra work on the project, and did said claim result in a change order? Yes \_\_\_\_ No \_\_\_\_
  5. If Yes:
- Project Name/Address \_\_\_\_\_
- Type of Event \_\_\_\_\_
- Name & Phone # of Owner: \_\_\_\_\_

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Contact Person at Owner: \_\_\_\_\_

- E. For all contracts within the past five years: (a) List all liens or claims over \$25,000 filed against the firm and remaining undischarged or unsatisfied for more than 90 days; and (b) list and describe all liquidated damages assessed: \_\_\_\_\_

**1.5 FINANCIAL INFORMATION**

- A. Submit firm's most recent annual financial statement and Dun and Bradstreet Report..

**1.6 OTHER INFORMATION**

- A. Within the past five years has the firm, any affiliate, any predecessor company or entity or any person identified in questions number 1.1 through 1.2 above been the subject of any of the following: (Respond to each question and describe in detail the circumstances of each affirmative answer: (Attach additional pages if necessary).
1. A judgment of conviction for any business-related conduct constituting a crime under state or federal law No\_\_ Yes\_\_
  2. A criminal investigation or indictment for any business-related conduct constituting a crime under state or federal law? No\_\_ Yes\_\_
  3. A grant of immunity for any business-related conduct constituting a crime under state and federal law? No\_\_ Yes\_\_
  4. A federal or state suspension or debarment? No\_\_ Yes\_\_
  5. A rejection of any bid for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? No\_\_ Yes\_\_
  6. A denial or revocation of prequalification? No\_\_ Yes\_\_
  7. A voluntary exclusion from bidding/contracting agreement? No\_\_ Yes\_\_
  8. Any administrative proceeding or civil action seeking specific performance or restitution in connection with any public works contract except any disputed work proceeding? No\_\_ Yes\_\_
  9. An OSHA Citation and Notification of Penalty containing a violation classified as serious? No\_\_ Yes\_\_
  10. An OSHA Citation or Notification of Penalty containing a violation classified as willful? No\_\_ Yes\_\_
  11. A prevailing wage or supplement payment violation? No\_\_ Yes\_\_
  12. A State Labor Law violation deemed willful? No\_\_ Yes\_\_
  13. Any other federal or state Citations, Notices, violation orders, pending administrative hearings or proceedings or determinations of a violation of any labor law or regulation? No\_\_ Yes\_\_
  14. Any criminal investigation, felony indictment or conviction concerning formation of or any business association with, an allegedly false or fraudulent women's, minority or disadvantaged business enterprise? No\_\_ Yes\_\_
  15. Any denial, desertification, revocation or forfeiture of Women's Business Enterprise, Minority Business Enterprise or Disadvantaged Business Enterprise status? No\_\_ Yes\_\_
  16. Rejection of a low bid on a State contract for failure to meet statutory affirmative action M/WBE requirements? No\_\_ Yes\_\_
  17. A consent order with the NYS Department of Environmental Conservation or a federal, state or local government enforcement determination involving a violation of federal or state environmental laws? No\_\_ Yes\_\_
  18. Any bankruptcy proceeding? No\_\_ Yes\_\_
  19. Any suspension or revocation of any business or professional license? No\_\_ Yes\_\_
  20. Any citations, notices, violation orders, pending administrative hearings or proceedings or determinations for violation of hearings or proceedings or determinations for violation of:
    - a. Federal, state or local health laws, rules or regulations? No\_\_ Yes\_\_

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- b. Federal, state or local environmental laws, rules and regulations? No\_\_ Yes\_\_
  - c. Unemployment insurance or workers compensation coverage or claim requirements.  
No\_\_ Yes\_\_
  - d. ERISA (Employee Retirement Income Security Act) No\_\_ Yes\_\_
  - e. Federal, state or local human rights laws. No\_\_ Yes\_\_
  - f. Federal, state or local labor laws. No\_\_ Yes\_\_
  - g. Federal or state security laws. No\_\_ Yes\_\_
  - h. Withdrawal or an agreement to withdraw a bid submitted to a public owner or a request by a public owner to withdraw a bid? No\_\_ Yes\_\_
- B. During the five year period preceding the submissions of this bid, has the bidder been named as a party in any lawsuit in an action involving a claim for personal injury or wrongful death arising from performance of work related to any project in which it has been engaged? If the answer to this question is yes, list all such lawsuits, the index number associated with said suit and the status of the lawsuit at the time of the submission of this bid. No\_\_ Yes\_\_
- C. During the five year period preceding the submission of this bid, has the bidder been the subject of proceedings before the Department of Labor for alleged violations of the Labor Law as it relates to the payment of prevailing wages and/or supplemental payment requirements? If the answer to this question is yes, please list each such instance of the commencement of a Department of Labor proceeding, for which project such proceeding was commenced, and the status of the proceeding at the time of the submission of this bid. No\_\_ Yes\_\_
- D. During the five year period preceding the bidder's submission of this bid, has the bidder been the subject of proceedings involving allegations that it violated the Worker's Compensation Law including but not limited to the failure to provide proof of worker's compensation or disability coverage and/or any lapses thereof. If the answer to this question is yes, list such instance of violation and the status of the claimed violation at the time of disposition of this bid. No\_\_ Yes\_\_
- E. Has the bidder, its officers, directors, owner and/or managerial employees been convicted of a crime or been the subject of a criminal indictment during the five years preceding the submission of this bid? If the answer to this question is yes, list the name of the individual convicted or indicted the charge against the individual and the date of submission of the charge. No\_\_ Yes\_\_
- F. During the five year period preceding the bidder's submission of this bid, has the bidder been charged with and/or found guilty of any violations of federal, state, or municipal environmental and/or health laws, codes, rules and/or regulations. If the answer to this question is yes, list the nature of the charge against the bidder, the date of the charge, and the status of the charge at the time of the submission of this bid. No\_\_ Yes\_\_
- G. Has the bidder ever defaulted or had its surety called upon to complete any contract awarded within the past five years. If the answer to this question is yes, list the projects, the dates and the nature of the termination (convenience, suspension, for cause). No\_\_ Yes\_\_
- H. Has any officer or partner of the bidder's organization ever defaulted or had its surety called upon to complete any contract awarded within the past five years or been an officer or partner of some other organization that has been terminated from a project by an owner? If yes, state: No\_\_ Yes\_\_
- I. Name of Individual(s) \_\_\_\_\_ Name of Organization(s) Reason(s) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**1.7 LICENSING**

- A. List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration of license numbers, if applicable. \_\_\_\_\_  
\_\_\_\_\_
- B. List jurisdictions in which your organization's partnership or trade name is filed: \_\_\_\_\_

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- C. Has any director, officer, owner or managerial employee had any professional license suspended or revoked? If the answer is yes, list the name of the individual, the professional license he/she formally had, whether the license was revoked or suspended and the date of the revocation or suspension. No\_\_ Yes\_\_

#### 1.8 EXPERIENCE

- A. List the categories of work that your organization will perform with its own forces: \_\_\_\_\_
- B. Claims and Suits. (If the answer of any of the questions below is yes, please attach details.)
1. Have you or has any director, officer, owner or managerial employee ever failed to complete any work awarded to them? If yes, list the project(s) the date(s) and the reason(s) for the failure to complete. No\_\_ Yes\_\_
  2. Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers? No\_\_ Yes\_\_
  3. Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years? No\_\_ Yes\_\_
  4. Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.) No\_\_ Yes\_\_
- C. On a separate sheet, list all construction projects presently your organization has in progress or completed, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.
- D. State total worth of work in progress and under contract: \_\_\_\_\_
- E. On the separate sheets, list all projects, not listed above, that your organization has completed or in progress in the past five years, giving the name of the project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.
- F. State average annual amount of construction work performed during the past five years: \_\_\_\_\_
- G. On a separate sheet, list the construction experience and present commitment of the key individuals of your organization.

#### 1.9 APPRENTICE PROGRAM

- A. Has the Firm have in place apprenticeship agreements appropriate for the type and scope of work to be performed, that have been registered with, and approved by, the Commissioner of the New York State Department of Labor pursuant to the requirements found in Article 23 of the Labor Law. No\_\_ Yes\_\_

#### 1.10 REFERENCES

- A. Trade reference: \_\_\_\_\_
- B. Bank references: \_\_\_\_\_
- C. Surety: \_\_\_\_\_
1. Name of present bonding company: \_\_\_\_\_
  2. Name and address of agent: \_\_\_\_\_
  3. Name or previous bonding company: \_\_\_\_\_

#### 1.11 CERTIFICATION

- A. The undersigned recognizes that this questionnaire is submitted for the purpose of the Greenwich Public Schools awarding a contract or approving a subcontract; acknowledges that the Owner may in its discretion, by means which it may choose, determine the truth and accuracy of all statements made herein; acknowledge that intentional submission of false or misleading information may constitute a felony under

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Penal Law §210.40 or a misdemeanor under Penal Law §210.35 or §210.45, and may also be punishable by a fine of up to \$10,000 or imprisonment of up to five years under 18 U.S.C. §1001; and states that the information submitted in this questionnaire any attached pages is true, accurate and complete.

Dated at this day of \_\_\_\_\_

Name of Organization: \_\_\_\_\_

By: \_\_\_\_\_ Title \_\_\_\_\_

being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading. Subscribed and sworn before me this day of: \_\_\_\_\_

Notary Public: \_\_\_\_\_ My Commission Expire: \_\_\_\_\_

**1.12 See Three (3) Project Qualification of Bidder Information Forms attached - Fill In.**

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**Project Name:** \_\_\_\_\_

**Company work was performed under:** \_\_\_\_\_

**Who was Co. Principal in charge:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Cost of Contract:** \_\_\_\_\_ **Final Cost of Work:** \_\_\_\_\_

**Description of work:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Owners Name:** \_\_\_\_\_

**Owner Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**CM Name( if applicable):** \_\_\_\_\_

**CM Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**Architect Firm:** \_\_\_\_\_

**Architect Contact:** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

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**Project Name:** \_\_\_\_\_

**Company work was performed under:** \_\_\_\_\_

**Who was Co. Principal in charge:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Cost of Contract:** \_\_\_\_\_ **Final Cost of Work:** \_\_\_\_\_

**Description of work:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Owners Name:** \_\_\_\_\_

**Owner Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**CM Name( if applicable):** \_\_\_\_\_

**CM Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**Architect Firm:** \_\_\_\_\_

**Architect Contact:** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

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**Project Name:** \_\_\_\_\_

**Company work was performed under:** \_\_\_\_\_

**Who was Co. Principal in charge:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Cost of Contract:** \_\_\_\_\_ **Final Cost of Work:** \_\_\_\_\_

**Description of work:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Owners Name:** \_\_\_\_\_

**Owner Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**CM Name( if applicable):** \_\_\_\_\_

**CM Contact: Name** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

**Architect Firm:** \_\_\_\_\_

**Architect Contact:** \_\_\_\_\_ **phone** \_\_\_\_\_ **e.mail** \_\_\_\_\_

END OF SECTION

## **NON-COLLUSION AFFIDAVIT**

**GREENWICH PUBLIC SCHOOLS  
290 GREENWICH AVE  
GREENWICH, CONNECTICUT**

State of \_\_\_\_\_:

County of \_\_\_\_\_:S.S.

I state that I am the \_\_\_\_\_ of \_\_\_\_\_  
(TITLE) (NAME OF MY FIRM)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid. I state that:

- (1) The price(s) and amount of this bid have been arrived at independently and without consultation communication or agreement with any other contractor, bidder/proposer or potential bidder/proposer.
- (2) Neither the price(s) nor the amount of this bid/rfp, and neither the approximate price(s) nor approximate amount of this bid/rfp, have been disclosed to any other firm or person who is a bidder/proposer or potential bidder/proposer, and they will not be disclosed before bid/rfp opening.
- (3) No attempt has been made or will be made to induce any firm or person to refrain from bidding/proposing on this contract, or to submit a bid/proposal higher than this bid/rfp, or to submit any intentionally high or noncompetitive bid/rfp or other form of complementary bid/rfp.
- (4) I fully understand that more than one offer from an individual, firm partnership, corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder/proposer is interested in more than one bid/rfp for the work contemplated may cause rejection of all bids/rfps in which the bidder/proposer is interested. Any or all bidders/proposers will be rejected if there is any reason for believing that collusion exists among the bidders/proposers. Participants in such collusion may not be considered in the future offers for the same work. Each bidder/proposer by submitting a bid/proposal certifies that it is not a part to any collusive action.
- (5) The bid/rfp of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid/proposal.
- (6) \_\_\_\_\_ its affiliates, subsidiaries, officers,  
(NAME OF MY FIRM)  
directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding/proposing on any public contract, except as follows:  
I state that \_\_\_\_\_ understands and acknowledges that  
(NAME OF MY FIRM)  
the above representations are material and important, and will be relied on by Greenwich Public Schools in awarding the bid/proposal for which this is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Greenwich Public Schools of the true facts relating to the submission of bids/proposals for this contract.
- (7) I agree to furnish and deliver all services on the date and time agreed on by

\_\_\_\_\_ and the Greenwich Board of Education at  
(NAME OF MY FIRM)

The time the purchase order is placed. Furthermore, there will not be any cancellations to the Board of Education. If a bidder/proposer submits a bid/proposal on any item he/she will be responsible for delivering that item at the bid/proposal cost, in accordance with the attached above specifications, which were submitted with this bid/proposal and upon which the bid/proposal was made.

- (8) In submitting this bid/proposal, the undersigned declares that this is made without any connection with any persons making another bid/proposal on the same contract; that the bid/proposal is in all respects fair and without collusion, fraud or mental reservation; and that no official of the Town, or any person in the employ of the Town, is directly or indirectly interested in said bid/proposal or in the supplies or work to which it relates, or in any portion of the profits thereof.
- (9) In submitting this bid, the undersigned further declares that it has not, and will not, induce or attempt to induce any Town of Greenwich employee or officer to violate the Greenwich Code of Ethics in connection with its offer to provide goods or services under, or otherwise in the performance of such contract.
- (10) The undersigned further understands that the above declarations are material representations to the Town of Greenwich made as a condition to the acceptance of the bid/proposal. If found to be false, the Town of Greenwich retains the right to reject said bid/proposal and rescind any resultant contract and/or purchase order and notify the undersigned accordingly, thereby declaring as void said bid/proposal and contract or purchase order.
- (11) The Greenwich Code of Ethics can be found at [www.greenwichct.org](http://www.greenwichct.org). Code of Ethics stated as follows:
1. **DEFINITION.** (1) Indirect interest, without limiting its generality, shall mean and include the interest of any subcontractor in any prime contract with the Town and the interest of any person or his immediate family in any corporation, firm or partnership which as a direct or indirect interest in any transaction with the Town. (2) Substantial financial interest shall mean any financial interest, direct or indirect, which is more than nominal and which is not common to the interest of other citizens of the Town. (3) Town Officer shall mean and include any official, commission, committee, legislative body or other agency of the Town. (4) Transaction shall mean and include the offer, sale or furnishing of any real or personal property, material, supplies otherwise, for the use and benefit of the Town for a valuable consideration, excepting the services of any person as a Town Officer.
  2. **GIFTS AND FAVORS.** No Town Officer or his immediate family shall accept any valuable gift, things, favor, loan or promise which might tend to influence the performance or nonperformance of his official duties.
  3. **IMPROPER INFLUENCE.** No Town Officer having a substantial financial interest in any transaction with the Town or in any action to be taken by the Town shall use is office to exert his influence or to vote on such transaction or action.

**VENDOR INFORMATION.** (Please print the following)

\_\_\_\_\_  
VENDOR NAME

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
TELEPHONE

\_\_\_\_\_  
FAX #

\_\_\_\_\_  
E-MAIL

\_\_\_\_\_  
WEB SITE

\_\_\_\_\_  
AUTHORIZED SIGNATURE

\_\_\_\_\_  
TITLE

- (12) By signing this bid/proposal the bidder/proposer understands and agrees to the attached terms, conditions, and specifications, including Collusion among Bidders/Proposers Employment Discrimination by the Contractor Prohibited.

\_\_\_\_\_  
SIGNATURE

SWORN AND SUBSCRIBED TO BEFORE ME, A NOTARY PUBLIC, IN AND FOR THE  
COUNTY OF \_\_\_\_\_ AND THE STATE OF \_\_\_\_\_

\_\_\_\_\_ THIS \_\_\_\_\_

DAY OF \_\_\_\_\_, 2023

\_\_\_\_\_ MY COMMISSION EXPIRES \_\_\_\_\_  
NOTARY PUBLIC

**COMPANY INFORMATION**

\_\_\_\_\_  
NAME OF FIRM          STREET          CITY,          STATE, ZIP

\_\_\_\_\_  
SALES REPRESENTATIVE NAME          TELEPHONE #          FAX #

## Minimum Rates and Classifications for Building Construction

**ID#:** 23-44622

**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: \_\_\_\_\_ Project Town: **Greenwich**  
 State#: \_\_\_\_\_ FAP#: \_\_\_\_\_  
 Project: **Millbank School Life Skills Classroom and Related Work**

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. <b>**See Laborers Group 7**</b>		
1c) Asbestos Worker/Heat and Frost Insulator	44.57	31.79
2) Boilermaker	45.21	29.05
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	39.4	35.65 + a
3b) Tile Setter	37.1	30.52
3c) Tile and Stone Finishers	30.0	25.30
3d) Marble & Terrazzo Finishers	31.07	24.23
3e) Plasterer	41.9	28.75

-----LABORERS-----

4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	32.0	24.40
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	32.25	24.40
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	32.5	24.40
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is \$26.80.	33.0	24.40
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	32.75	24.40
4e) Group 6: Blasters, nuclear and toxic waste removal.	35.0	24.40
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	33.0	24.40
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	30.28	24.40
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	29.74	24.40
4i) Group 10: Traffic Control Signalman	18.0	24.40
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.	36.07	26.15

**As of:** February 2, 2023

5a) Millwrights	37.02	27.66
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)	42.0	38.83
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	61.42	37.335+a+b
-----LINE CONSTRUCTION-----		
Groundman	26.5	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00
8) Glazier (Trade License required: FG-1,2)	40.78	23.40 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	39.7	38.77 + a
----OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone; Hoisting Engineer (2 drums or over). (Trade License Required)	50.27	26.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and Over	46.07	26.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	49.91	26.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	49.06	26.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer)	45.71	26.80 + a

**As of:** February 2, 2023

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)	44.86	26.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper); Goldhofer.	44.42	26.80 + 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).	43.73	26.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	43.73	26.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	43.38	26.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under mandrel).	42.99	26.80 + a
Group 8: Mechanic; Grease Truck Operator; Hydroblaster; Barrier Mover; Power Stone Spreader; Welding; Work Boat Under 26 ft.; Transfer Machine; Rigger Foreman.	42.54	26.80 + 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).	42.04	26.80 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	39.7	26.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	39.7	26.80 + a

**As of:** February 2, 2023

Group 12: Wellpoint Operator.	39.63	26.80 + a
Group 13: Compressor Battery Operator.	38.97	26.80 + a
Group 14: Elevator Operator; Tow Motor Operator (solid tire no rough terrain).	37.66	26.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	37.2	26.80 + a
Group 16: Maintenance Engineer.	36.46	26.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator; Portable Grout Plant Operator; Portable Water Filtration Plant Operator.	41.39	26.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (Minimum for any job requiring a CDL license); Rigger; Signalman.	38.61	26.80 + a
-----PAINTERS (Including Drywall Finishing)-----		
10a) Brush and Roller	37.22	23.40
10b) Taping Only/Drywall Finishing	37.97	23.40
10c) Paperhanger and Red Label	37.72	23.40
10e) Blast and Spray	40.22	23.40
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	47.03	34.05
12) Well Digger, Pile Testing Machine	37.26	24.05 + a

**As of:** February 2, 2023

Roofer: Cole Tar Pitch	43.5	22.30 + a
Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing	42.0	22.30 + a
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	48.77	45.20
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)	47.03	34.05
-----TRUCK DRIVERS-----		
17a) 2 Axle, Helpers	31.16	28.78 + a
17b) 3 Axle, 2 Axle Ready Mix	31.27	28.78 + a
17c) 3 Axle Ready Mix	31.33	28.78 + a
17d) 4 Axle	31.39	28.78 + a
17e) 4 Axle Ready Mix	31.44	28.78 + a
17f) Heavy Duty Trailer (40 Tons and Over)	33.66	28.78 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	31.44	28.78 + a
17h) Heavy Duty Trailer up to 40 tons	32.39	28.78 + a

**As of:** February 2, 2023

17i) Snorkle Truck	31.54	28.78 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	47.55	28.96 + a
19) Theatrical Stage Journeyman	25.76	7.34

*Welders: Rate for craft to which welding is incidental.*

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

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

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

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

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman 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:** February 2, 2023

**As of:** February 2, 2023

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

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

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

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

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

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

## **Informational Bulletin**

### **THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE**

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

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is [http://www.osha.gov/fso/ote/training/edcenters/fact\\_sheet.html](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 ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.**

November 29, 2006

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

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

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

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

**Forklift Operator:**

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

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

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

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

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

## Statute 31-55a

You are here: [DOL Web Site](#) » [Wage and Workplace Standards](#) » Statute 31-55a

### - Special Notice -

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

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

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

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

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


←-- [Workplace Laws](#)

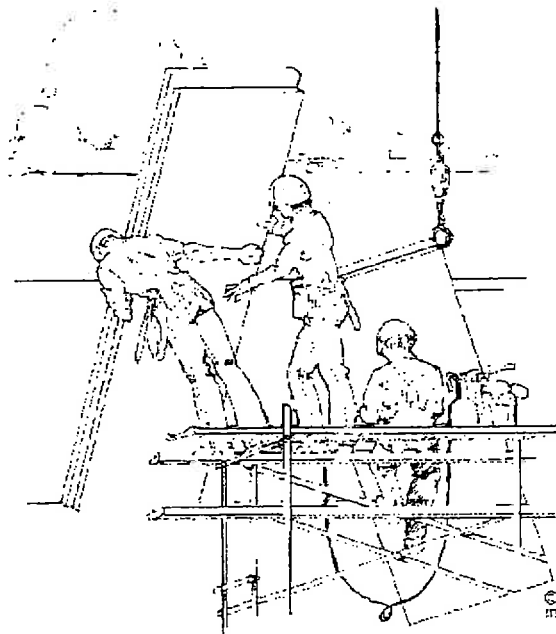
## ~NOTICE~

### TO ALL CONTRACTING AGENCIES

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

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

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



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

*CONTRACTING AGENCY CERTIFICATION FORM*

I, \_\_\_\_\_, acting in my official capacity as \_\_\_\_\_,  
authorized representative title

for \_\_\_\_\_, located at \_\_\_\_\_,  
contracting agency address

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

\_\_\_\_\_, located at \_\_\_\_\_,  
project name and number address

shall be \$ \_\_\_\_\_, which includes all work, regardless of whether such project  
consists of one or more contracts.

*CONTRACTOR INFORMATION*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Authorized Representative: \_\_\_\_\_

Approximate Starting Date: \_\_\_\_\_

Approximate Completion Date: \_\_\_\_\_

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

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

Date Issued: \_\_\_\_\_

CONNECTICUT DEPARTMENT OF LABOR  
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

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): \_\_\_\_\_

## Certified Payroll Form WWS - CPI

**You are here:** [DOL Web Site](#) » [Wage and Workplace Standards](#) » Certified Payroll Form WWS - CPI

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

**Note:** Once you have downloaded these forms and are ready to print them out, set the print function on your PC to the horizontal print orientation.

**Note2:** Please download both the Payroll Certification for Public Works Projects **and** the Certified Statement of Compliance for a complete package. The Certified Statement of Compliance appears on the same page as the Fringe Benefits Explanation page.

**Announcement: The Certified Payroll Form WWS-CPI can now be completed on-line!**

- [Certified Payroll Form WWS-CPI](#) (PDF, 727KB)
- [Sample Completed Form](#) (PDF, 101KB)

Published by the Connecticut Department of Labor, Project Management Office  
Last Updated: April 22, 2010

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							Total \$T Hours	BASE HOURLY RATE	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS			GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY	
				HOURS WORKED EACH DAY											FICA	WITH- HOLDING	STATE			LIST OTHER
				S	M	T	W	TH	F	S										
				Total O/T Hours	Total FRINGE BENEFIT PLAN CASH															
											S-TIME	\$	1. \$							
												Base Rate	2. \$							
											O-TIME	\$	4. \$							
												Cash Fringe	5. \$							
												Cash Fringe	6. \$							
											S-TIME	\$	1. \$							
												Base Rate	2. \$							
												Base Rate	3. \$							
											O-TIME	\$	4. \$							
												\$	5. \$							
												Cash Fringe	6. \$							
											S-TIME	\$	1. \$							
												Base Rate	2. \$							
												Base Rate	3. \$							
											S-TIME	\$	4. \$							
												\$	5. \$							
												Cash Fringe	6. \$							
											S-TIME	\$	1. \$							
												Base Rate	2. \$							
												Base Rate	3. \$							
											S-TIME	\$	4. \$							
												\$	5. \$							
												Cash Fringe	6. \$							

**\*IF REQUIRED**



**\*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 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.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
Submitted on (Date)

**Section B: Applies to CONNDOT Projects ONLY**

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

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
Submitted on (Date)

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

\*\*\*THIS IS A PUBLIC DOCUMENT\*\*\*

\*\*\*DO NOT INCLUDE SOCIAL SECURITY NUMBERS\*\*\*

**Weekly Payroll Certification For  
Public Works Projects (Continued)**

**Week-Ending Date:**  
**Contractor or Subcontractor Business Name:**

[illegible]

\*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.

**PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS**

In accordance with General Order 10-16 (Rev) 015

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0893-3200/99/\$12.00 DOI: 10.1037/0893-3200.13.4.555

[illegible]

**FOR PUBLIC WORKS  
WEEKLY PAYROLL**

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

## WORKER'S COMPENSATION INSURANCE CARRIER

Travelers Insurance Company  
POLICY # 88AC8098928

EFFECTIVE DATE: 1/1/09

EXPIRATION DATE: 12/31/09

RECEIVED - 10/15/1964

XYZ Corporation  
2 Main Street  
Xenith, CT 06388

1000 Connecticut Avenue, Northford, CT 06457

1000 Connecticut Avenue, Northford, CT 06457

DATE	NUMERO	WEEK-END	PROJECT NAME & ADDRESS
11/11/11	1111		1111 11th St, New York, NY 10001
11/12/11	1112		1112 11th St, New York, NY 10001
11/13/11	1113		1113 11th St, New York, NY 10001
11/14/11	1114		1114 11th St, New York, NY 10001
11/15/11	1115		1115 11th St, New York, NY 10001
11/16/11	1116		1116 11th St, New York, NY 10001
11/17/11	1117		1117 11th St, New York, NY 10001
11/18/11	1118		1118 11th St, New York, NY 10001
11/19/11	1119		1119 11th St, New York, NY 10001
11/20/11	1120		1120 11th St, New York, NY 10001
11/21/11	1121		1121 11th St, New York, NY 10001
11/22/11	1122		1122 11th St, New York, NY 10001
11/23/11	1123		1123 11th St, New York, NY 10001
11/24/11	1124		1124 11th St, New York, NY 10001
11/25/11	1125		1125 11th St, New York, NY 10001
11/26/11	1126		1126 11th St, New York, NY 10001
11/27/11	1127		1127 11th St, New York, NY 10001
11/28/11	1128		1128 11th St, New York, NY 10001
11/29/11	1129		1129 11th St, New York, NY 10001
11/30/11	1130		1130 11th St, New York, NY 10001

Date \_\_\_\_\_ NOT 106-284-Howe 82

PERSON WORKER, ADDRESS AND SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION & Number - DSHA In Certification Number	DAY AND DATE							TOTAL ST Hours	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				HOURS WORKED EACH DAY										PICA	WITH- HELDING	FEDERAL STATE	LST OTHER		
				S	M	T	W	TH	F	S									
				20	21	22	23	24	25	26									
Robert Graft 81 Maple Street Williamsville, CT 06226		M/D	Electrical Lineman E-L 1234567 Owner DSHA 123468		8	8	8	0	8		B-TIME \$ 30.75 40 Base Rate O-TIME \$ 8.82 Cash Fringe	\$ 1,582.80				P-KKKK	\$1,002.90	#123 \$ XXX.XX	
Ronald Jones 81 Elm Street Norwich, CT 06360	65%	M/B	Electrical Apprentice DSHA 234567		8	8	8	8	8		B-TIME \$ 19.09 40 Base Rate O-TIME \$ 16.03 Cash Fringe	\$1,404.80	XX.XX KKK.XX		Q-KKK	XX.XX	\$1,464.80	#124 \$XXX.XX	
Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B		M/H	Project Manager			8					B-TIME 8 Base Rate O-TIME Cash Fringe	\$1,600.00	XX.XX XX.XX		M-KKK	XX.XX		#125 XXXX.XX	

713 5000 612 8 177 000 000

15:15:15

1

IN A FEW YEARS 12,115,723

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

**Section B: Applies to CONNDOT Projects ONLY**

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

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

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CPI 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\*\*\*

# Occupational Classification Bulletin

**You are here:** [DOL Web Site](#) › [Wage and Workplace Standards](#) › Occupational Classification Bulletin

- [Informational Bulletin \(PDF, 479KB\)](#) updated

Published by the Connecticut Department of Labor, Project Management Office  
Last Updated: April 22, 2010

## **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.

***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.***

**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. PILEDRIVMEN. 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.

- **CLEANING LABORER**

The clean up of any construction debris and the general cleaning, including sweeping, wash down, mopping, wiping of the construction facility, washing, polishing, dusting, etc., prior to the issuance of a certificate of occupancy falls under the *Labor classification*.

- **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/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 requires either a blended rate or 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 requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.

- **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. Past practice using the applicable licensed trades, Plumber, Sheet Metal, Sprinkler Fitter, and Electrician, is not inconsistent with the Insulator classification and would be permitted.

- **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), metal bridge handrail, and decorative security fence 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. (tear-off and/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, assemble, install and repair 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, fascia, louvers, partitions, wall panel siding, 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. Insulated metal and insulated composite panels are still installed by the Iron Worker. 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.

- **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**

**Definitions:**

1) "Site of the work" (29 Code of Federal Regulations (CFR) 5.2(l)(b) is the physical place or places where the building or work called for in the contract will remain and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project;

(a) Except as provided in paragraph (l) (3) of this section, job headquarters, tool yards, batch plants, borrow pits, etc. are part of the "site of the work"; provided they are dedicated exclusively, or nearly so, to the performance of the contract or project, and provided they are adjacent to "the site of work" as defined in paragraph (e)(1) of this section;

(b) Not included in the "site of the work" are permanent home offices, branch plant establishments, fabrication plants, tool yards etc, of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular State or political subdivision contract or uncertain and indefinite periods of time involved of a few seconds or minutes duration and where the failure to count such time is due to consideration justified by industrial realities (29 CFR 785.47)

2) "Engaged to wait" is waiting time that belongs to and is controlled by the employer which is an integral part of the job and is therefore compensable as hours worked. (29 CFR 785.15)

3) "Waiting to be engaged" is waiting time that an employee can use effectively for their own purpose and is not compensable as hours worked. (29 CFR 785.16)

4) "De Minimus" is a rule that recognizes that unsubstantial or insignificant periods of time which cannot as a practical administrative matter be precisely recorded for payroll purposes, may be disregarded. This rule applies only where there are uncertain and indefinite periods of time involved of a short duration and where the failure to count such time is due to consideration justified by worksite realities. For example, with respect to truck drivers on prevailing wage sites, this is typically less than 15 minutes at a time.

**Coverage of Truck Drivers on State or Political subdivision Prevailing Wage Projects**

**Truck drivers are covered for payroll purposes under the following conditions:**

- Truck Drivers for time spent working on the site of the work.
- Truck Drivers for time spent loading and/or unloading materials and supplies on the site of the work, if such time is not de minimus

- Truck drivers transporting materials or supplies between a facility that is deemed part of the site of the work and the actual construction site.
- Truck drivers transporting portions of the building or work between a site established specifically for the performance of the contract or project where a significant portion of such building or work is constructed and the physical places where the building or work outlined in the contract will remain.

*For example: Truck drivers delivering asphalt are covered under prevailing wage while "engaged to wait" on the site and when directly involved in the paving operation, provided the total time is not "de minimus"*

**Truck Drivers are not covered in the following instances:**

- Material delivery truck drivers while off "the site of the work"
- Truck Drivers traveling between a prevailing wage job and a commercial supply facility while they are off the "site of the work"
- Truck drivers whose time spent on the "site of the work" is de minimus, such as under 15 minutes at a time, merely to drop off materials or supplies, including asphalt.

*These guidelines are similar to U.S. Labor Department policies. The application of these guidelines may be subject to review based on factual considerations on a case by case basis.*

**For example:**

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

*Any questions regarding the proper classification should be directed to:*

*Public Contract Compliance Unit  
Wage and Workplace Standards Division  
Connecticut Department of Labor  
200 Folly Brook Blvd, Wethersfield, CT 06109  
(860) 263-6543*

Connecticut Department of Labor  
Wage and Workplace Standards Division  
FOOTNOTES

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

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

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

**Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers (including caulking),  
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.

**Bricklayer (Residential- Fairfield County)**

- a. Paid Holiday: If an employee works on Christmas Eve until noon he shall be paid for 8 hours.

**Electricians**

Fairfield County: West of the Five Mile River in Norwalk

- a. \$2.00 per hour not to exceed \$14.00 per day.

**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 4<sup>th</sup>, 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.

GREENWICH PUBLIC SCHOOLS  
GREENWICH, CONNECTICUT

Contract Cover Sheet  
Letter of Intent / Award Letter  
Invitation To Bid  
Bid Sheet  
Contract for XXXXXXXXXXXXXXXXXXXXXXXX  
Bid Bond  
Corporate Principal  
Performance, Maintenance and Payment Bond  
Insurance Procedure  
Insurance Requirement Sheet  
Endorsement Letter  
Acord Form  
A.M. Best Key Rating Guide Sheet  
Affirmative Action Compliance Affidavit  
Consent of Surety  
Final Payment

**CONTRACT**

**FOR**

**(name of project)**

**AT**

**(name of school)**

**Contract No.**

GREENWICH PUBLIC SCHOOLS  
GREENWICH, CT.

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## **AWARD LETTER**

FORM OF BID BOND  
TOWN OF GREENWICH, CONNECTICUT

\_\_\_\_\_  
Date Bond Executed

BID BOND

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Penal Sum of Bond (express in words and figures)

\_\_\_\_\_  
Date of Bid

\_\_\_\_\_  
KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the Town of Greenwich, Connecticut, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated as shown above for \_\_\_\_\_.  
(name of bid)

\_\_\_\_\_  
NOW THEREFORE, if the principal shall not withdraw said bid within the period specified therein after the opening of the same, or if no period be specified, within sixty (60) days after said opening, and shall within the period specified therefor, or if no period specified, within ten (10) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the Bid as accepted, and give bonds with good and sufficient surety or sureties as may be required, for the faithful performance and proper fulfillment of the resulting contract, and for the protection of all persons supplying labor and materials in the prosecution of the work provided for in such contract or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the Town of Greenwich, Connecticut, the difference between the amount specified in said bid and the amount for which said Town may procure the required work, supplies, and services, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF the above-bounden parties have executed this instrument under their several seals on the date indicated above. The name and corporate seal (if applicable) of each corporate party being hereto affixed:

\_\_\_\_\_  
Name of Partnership  
\_\_\_\_\_(SEAL)  
\_\_\_\_\_  
Business Address  
\_\_\_\_\_  
Partner – (Hereunto Duly Authorized)

IN THE PRESENCE OF:

WITNESS

INDIVIDUAL PRINCIPAL

1. _____ AS	TO _____ (SEAL)
2. _____ AS	TO _____ (SEAL)
3. _____ AS	TO _____ (SEAL)
4. _____ AS	TO _____ (SEAL)

\*\*\*\*\*

_____	CORPORATE / LLC PRINCIPAL
WITNESS	_____
	BUSINESS ADDRESS    AFFIX
	CORPORATE
	SEAL
_____	

	_____
	BY – (HEREUNTO DULY AUTHORIZED)
	_____
	TITLE

\*\*\*\*\*

	_____
	CORPORATE SURETY
WITNESS	_____
	BUSINESS ADDRESS    AFFIX
	CORPORATE
	SEAL
_____	
	_____
	BY – (HEREUNTO DULY AUTHORIZED)
	_____
	TITLE

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, \_\_\_\_\_, certify that I am the  
\_\_\_\_\_ of the corporation named as principal in the within bond;  
that \_\_\_\_\_, who signed said bond on behalf of the principal, was  
then \_\_\_\_\_ of the corporation; that I know his signature, and his signature  
thereto is genuine; and that said bond was duly signed, sealed and attested for and in behalf of said  
corporation by authority of its governing body.

\_\_\_\_\_  
(Corporate Seal)

# PERFORMANCE, MAINTENANCE AND PAYMENT BOND

BOND NO. \_\_\_\_\_ CONTRACT NO. \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS. That we \_\_\_\_\_,  
\_\_\_\_\_, as Principal, and

\_\_\_\_\_ a corporation organized under the laws of the State of \_\_\_\_\_ and authorized to do business in the State of Connecticut as Surety, are holden and firmly bound jointly and severally unto the TOWN OF GREENWICH, CONNECTICUT, hereafter referred to as the Town, a territorial corporation located in the County of Fairfield, in the penal sum of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_),

to be paid to it or its certain attorney, successors or assigns, to which payment well and truly to be made, we the said Obligors do

bind ourselves, and each of us, our heirs, executors, administrators, and successors firmly by these presents.

IN WITNESS WHEREOF we have hereunto set or caused to be set our respective hands, names and seals this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_.

THE CONDITION OF THIS OBLIGATION IS SUCH, That whereas the above named Principal has entered into a certain written contract with the TOWN OF GREENWICH, CONNECTICUT, dated the \_\_\_\_\_ day of \_\_\_\_\_ 2023 for construction of **CONTRACT NO.** \_\_\_\_\_

\_\_\_\_\_ (*Description of work here – Usually the name of the bid*) according to the plans and specifications prepared by the **TOWN OF GREENWICH**, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, if the said Principal shall well and faithfully perform said contract according to its provisions, and fully indemnify and save harmless the Town from all cost and damages which the Town may suffer by reason of failure so to do, and shall pay for all equipment, appurtenances, materials and labor furnished, used or employed in the execution of said contract, and shall indemnify and save harmless the Town from all suits or claims of any nature or description against the Town by reason of any injuries or damages sustained by any person or persons on account of any act or omission of said Principal, his servants or agents, or his subcontractors in the construction of the work or in guarding the work, or on account of the use of faulty or improper materials, or by reason of claims under the Workmen's Compensation Laws or other laws by any employee of the Principal or his subcontractors, or by reason of the use of any patented material, machinery, device, equipment, process, method of construction or design in any way involved in the work, and shall indemnify the Town against such defective workmanship, material and equipment as may be discovered within one (1) year after completion and final acceptance of the work, and shall make good in such defective workmanship and material as may be discovered within said period of one year, then this obligation shall be void, otherwise to remain in full force and effect.

The Surety hereby stipulates and agrees that any modifications, omissions or additions in or to the terms of the aforesaid contract, or in or to the plans or specifications therefor, or any extension of time, shall in no wise affect the obligation of the Surety under this bond, the Surety hereby waiving any and all right to any notice of any such modifications, omissions, changes, additions or extensions.

**CONTRACTOR** \_\_\_\_\_

**BY** \_\_\_\_\_

**SURETY** \_\_\_\_\_

**BY** \_\_\_\_\_



## **INSURANCE PROCEDURE**

### **PLEASE NOTE:**

**THIS PAGE MUST BE RETURNED WITH YOUR BID/PROPOSAL. FAILURE TO DO SO MAY RESULT IN YOUR BID/PROPOSAL BEING REJECTED.**

Please take the insurance requirements of the Contract to your agent/broker immediately upon receipt of the bid documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in this Request for Bid/Proposal. Any bids/proposals with deficient insurance requirements will be rejected.

### **STATEMENT OF VENDOR:**

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. The bid/proposal cost reflects any additional costs relating to insurance requirements for this work.

---

Signature

---

Date

---

Contractor

**Insurance Requirements:** Before starting and until final completion and acceptance of the work called for in the Contract and expiration of the guarantee period provided for in the Contract, the Contractor and its subcontractors, if any, shall procure and maintain insurance of the types and amounts checked in paragraphs A through F below for all Contract operations.

- ☒ A. General Liability, with minimum coverages for combined bodily injury and property damage liability of **\$2,000,000** general aggregate, **\$1,000,000** per occurrence including:
- ☒ 1. Commercial General Liability.
  - ☒ 2. Town as additional insured.
  - ☐ 3. Owners and Contractors Protective Liability (separate policy in the name of the Town).
- ☒ B. Comprehensive Automobile Liability, with minimum coverages of **\$1,000,000** combined single limit for bodily injury and property damage, including, where applicable, coverage for any vehicle, all owned vehicles, scheduled vehicles, hired vehicles, non-owned vehicles and garage liability.
- ☒ C. Excess Liability with minimum coverage of **\$5,000,000** in umbrella form, or such other form as approved by Town Department Head and Risk Management Director.
- ☒ D. Workers' Compensation and Employer's Liability, with minimum coverages as provided by Connecticut State Statutes.
- ☐ E. Professional Liability (for design and other professionals for Errors and Omissions) with minimum coverage of **\$1,000,000**. If the policy is on a claims-made basis, coverage shall be continually renewed or extended for three (3) years after work is completed under the Contract.
- ☐ F. Other (Builder's Risk etc.):\_\_\_\_\_.
- ☒ G. CERTIFICATE HOLDER: TOWN OF GREENWICH, BOARD OF EDUCATION, ATTN: BOARD OF EDUCATION (also fill in on ACORD Certificate of Insurance) 290 Greenwich Avenue, Greenwich, CT 06830.

The **Acord certificate of insurance form** must be executed by your insurance agent/broker and returned to this office. Company name and address must conform on all documents including insurance documentation. It is required that the agent/broker note the individual insurance companies providing coverage, rather than the insurance group, on the Acord form. The Contract number (provided to the awarded Contractor), project name and a brief description must be inserted in the "Description of Operations" field. It must be confirmed on the Acord Form that the Town of Greenwich is endorsed as an additional insured by having the appropriate box checked off and stating such in the "Description of Operations" field. **A letter from the awarded vendor's agent/broker certifying that the Town of Greenwich has been endorsed onto the general liability policy as an additional insured is also mandatory.** This letter **must follow exactly the format provided by the Purchasing Department and must be signed by the same individual authorized representative who signed the Acord form.** If the insurance coverage required is provided on more than one Acord certificate of insurance, then additional endorsement letters are also required. Contract development will begin upon receipt of complete, correct insurance documentation.

The Contractor shall be responsible for maintaining the above insurance coverages in force to secure all of the Contractor's obligations under the Contract with an insurance company or companies with an AM Best Rating of B+:VII or better, licensed to write such insurance in Connecticut and acceptable to the Risk Manager, Town of Greenwich. For excess liability only, non-admitted insurers are acceptable, provided they are permitted to do business through Connecticut excess line brokers per listing on the current list of Licensed Insurance Companies, Approved Reinsurers, Surplus Lines Insurers and Risk Retention Groups issued by the State of Connecticut Insurance Department.

**(SAMPLE ENDORSEMENT LETTER)**

**AGENT/BROKER  
(LETTERHEAD)**

(Date)

Eugene H. Watts, Senior Buyer  
Purchasing Department  
Town of Greenwich/Board of Education  
290 Greenwich Avenue – Havemeyer Building  
Greenwich, CT 06830

Re:

Town of Greenwich/Board of Education / **Contract #**

Dear Mr. Watts:

The undersigned hereby certifies as follows:

- (1) I am a duly licensed insurance agent under the laws of the State of [insert State] and an authorized representative of all companies affording coverage under the Acord form submitted herewith;
- (2) The Town of Greenwich has been endorsed as an additional insured under the general liability policy no. [insert policy number], issued by [insert company affording coverage] to [name of insured];
- (3) The general liability policy referenced in paragraph (2) above meets or exceeds the coverage in Commercial General Liability ISO form CG 00 01 10 01, including contractual liability;
- (4) The policies listed in the Acord form submitted to the Town of Greenwich in connection with the above-referenced contract have been issued to the insured in the amounts stated and for the periods indicated in the Acord form; and
- (5) Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Sincerely,

Authorized Representative for all companies listed in the Acord form

## **A. M. BEST KEY RATING GUIDE FORM**

The \_\_\_\_\_ is licensed in  
The State of Connecticut as per listing in the 2021 edition of the  
A.M. Best Key Rating Guide for Property and Casualty, page  
Number \_\_\_\_\_.  
Their rating is \_\_\_\_\_.

**COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES  
CONTRACT COMPLIANCE REGULATIONS  
NOTIFICATION TO BIDDERS**

**AFFIRMATIVE ACTION COMPLIANCE AFFIDAVIT**

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in the daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

- (a) the bidder's success in implementing an affirmative action plan;
- (b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder's promise to develop and implement a successful affirmative action plan;
- (d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

**\*INSTRUCTIONS:** Bidder must sign acknowledgement below and return acknowledgement to Awarding Agency along with bid proposal.

The undersigned acknowledges receiving and reading a copy of the "Notification to Bidders" form.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

On behalf of:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# SAMPLE COPY – DO NOT USE:

## **BID SHEET**

Bids must be submitted to the Greenwich Public Schools, Havemeyer Building, 290 Greenwich Avenue, Greenwich, Connecticut 06830, Attention Mr. Eugene H. Watts, Senior Buyer, Purchasing Department on the following form signed by an authorized company officer.

Greenwich Public Schools  
Havemeyer Building  
290 Greenwich Avenue  
Greenwich, CT 06830

Date \_\_\_\_\_  
Re: \_\_\_\_\_

Gentlemen:

(I, We) \_\_\_\_\_ the undersigned having visited the site of the \_\_\_\_\_ School and having familiarized ourselves with the local conditions affecting the cost of the work and with Contract Documents and all addenda to said Documents, hereby propose to furnish all labor, tools, materials, equipment and insurance, to pay all applicable taxes, and to do and perform all things as provided in the Specifications for \_\_\_\_\_ for the following sum:

Base Bid \$ \_\_\_\_\_

Signed \_\_\_\_\_  
(Corporate Seal)

Address \_\_\_\_\_

Telephone Number \_\_\_\_\_

## INFORMATION FOR BIDDERS

### 1. Form and Submission of Bid

- a. One copy of this document will be furnished to the bidders. The Bid Sheet shall be completed and returned as part of the bid. The copy submitted by the successful bidder shall be completed in its entirety, executed and retained by the Town of Greenwich, sometimes referred to as the Town. From this executed copy, three other conformed copies will be made, one of which will be sent to the Contractor.
- b. Bid Documents must be enclosed in a sealed opaque envelope plainly marked on the outside with the name and address of the Contractor; addressed to the Purchasing Agent, Greenwich Public Schools, Havemeyer Building, 290 Greenwich Avenue, Greenwich, Connecticut, and shall be labeled as indicated in Invitation to Bidders.
- c. It shall be the responsibility of each Bidder to have his Bid Proposal at the Business Office at the time of Bid Opening; neither the Town of Greenwich nor the Board of Education shall be held in any way for failure of bidder to have his Bid Proposal submitted at such time and Bids arriving after the indicated Bid Opening time will not be accepted. Late bids arriving by mail shall be returned to the sender unopened.

### 2. Bid Security

Each Bid must be accompanied by Bid Bond prepared on the Form of Bid Bond attached hereto duly executed and acknowledged by the Bidder, as Principal, and by a surety satisfactory to Town as Surety. Bid Bond shall be in the sum of 10% of bid amount and shall be enclosed in the sealed envelope containing the Bid. Each such Bid Bond may be held by the Town as security for the fulfillment of the Bidder's agreements as hereinabove set forth and as set forth in the Bid. Should the Bidder fail to fulfill such agreements, the Bid Bond shall become payable to the Town as liquidated damages; otherwise, the Bid Bond shall become null and void. A BID BOND will not be required where the total estimated cost of labor and materials under the contract with respect to which such general bid is submitted is less than fifty thousand dollars (\$50,000).

3. Withdrawal of Bids

Except as hereinafter in this subsection expressly provided, once his Bid is submitted and received by the Town for consideration and comparison with the other bids similarly submitted, the Bidder agrees that he may not and will not withdraw it within thirty (30) consecutive calendar days after the actual date of the opening of Bids unless extended by addendum.

Upon proper written request and identification, Bids may be withdrawn only as follows:

- a. At any time prior to the designated time for the opening of bids.
- b. Unless a Bid is withdrawn as provided above, the Bidder agrees that it shall be deemed open for acceptance until the Agreement has been executed by both parties thereto or until the Town notifies a Bidder in writing that his Bid is rejected or that the Town does not intend to accept it. Notice of acceptance of a Bid shall not constitute rejection of any other Bid.

4. Bidders to Investigate

Where applicable, Bidders are required to submit their Bids upon the following express conditions which shall apply to and be deemed a part of every Bid received, "viz".

Bidders must satisfy themselves by personal examination of the site of the work and by such means as they may wish, as to the actual conditions there existing, the character and requirements of the work, and the difficulties attendant upon its execution, and the accuracy of all estimated quantities, if any, stated in the Bid.

5. Ability and Experience of Bidder

No award will be made to any Bidder who cannot satisfy the Town that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named or where such time is not named, within a reasonable period of time as is determined by the contracting officer or agency. The Town's decision or judgment on these matters shall be final, conclusive and binding.

The Town may make such investigations as it deems necessary, and the Bidder shall furnish to the Town, under oath if so required, all such information and data for this purpose as the Town may request.

6. Interpretations

Questions Regarding Drawings and Documents. No answer will be given to prospective Bidders in reply to an oral question if the question involves an interpretation of the intent or meaning of the Drawings, if any, or other Contract Documents or the quality or use of products or methods other than those designated or described on the Drawings, if any, and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the Bidder only, and is not guaranteed. The Bidder agrees that such information shall not be used as the basis of nor shall the giving of such information entitle the Bidder to assess any claim or demand against the Town or Board of Education.

To receive consideration, such questions shall be submitted in writing to the Board of Education at least ten (10) calendar days before the established date for receipt of Bids. If the question involves the quality or use of products or methods, it must be accompanied by Drawings, Specifications, or data in sufficient detail to enable the Board of Education to determine the quality or suitability of the products or method. In general, the Board of Education will neither approve nor disapprove particular products prior to the opening of bids; such products will be considered when offered by the Contractor for incorporation into the work.

The Contracting Officer will set forth as addenda, which shall become a part of the Contract Documents, such questions received as above provided as in his sole judgment are appropriate or necessary and his decision regarding each. At least seven (7) days prior to the receipt of Bids, he will send a copy of these addenda to those prospective Bidders known to have taken out sets of the Drawings and other Contract Documents.

The Contractor agrees to use the products and methods designated or described in the specifications or as amended by the addenda.

- a. Bids. The Board of Education reserves the right to reject Bids which in its judgment are either incomplete, conditional, obscure, or not responsible or which contain additions not called for, erasures not properly initialed, alterations or similar irregularities if deemed in the Town's best interest to do so.
- b. Right to Reject or Accept Bids. The Board of Education reserves the right to reject any and all bids not deemed to be in the best interest of the Town of Greenwich. The Board of Education reserves the right to waive any informalities in or reject any or all bids, or any part of any bid.
- c. Execution of Agreement. The Bidder whose Bid is accepted will be required and agrees to duly execute the Agreement and furnish the required Bond within such time as deemed reasonable by the Town or Contracting Officer.

d. Non-Connecticut Contractors 5 % Tax.

Pursuant to Connecticut General Statutes § 12-430(7), as amended by Public Act No11,61, Section 66, a non-resident contractor shall comply with the State of Connecticut's bonding requirements.

7. Bid Bond

- a. The Bid Bond form given on the following pages shall be used.
- b. The surety on the bond may be any corporation authorized to act as surety in the State of Connecticut.
- c. The full name and business or residence address of each individual party to the bond shall be inserted in the space provided therefore, and each party shall sign the bond with his usual signature on the line opposite the scroll seal.
- d. If the principals are partners, their individual names shall appear in the space provided therefore, with the recital that they are partners composing a firm, naming it, and the bond shall be executed by a general partner who has been authorized to act on behalf of the partnership.
- e. If the principal or surety is a corporation, the name of the state in which incorporate shall be inserted in the space provided therefore, and said instrument shall be executed and attested under the corporate seal, the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name.
- f. The official character and authority of the person or persons executing the bond for a corporation shall be certified by a proper officer. In lieu of such certificate, there may be attached to the bond copies of so much of the records of the corporation as will show the official character and authority of the officers signing duly certified by a proper officer, under the corporate seal, to be true copies.
- g. The date of this bond must not be prior to the date of the instrument in connection with which it is given.

8. Minimum Wages and Payment to Subcontractors

- a. The work specified in this contract is subject to prevailing wage rates as fixed by the Labor Commissioner of the State of Connecticut and a schedule of such rates is deemed to be incorporated herein.
- b. A general or prime contractor is required by Connecticut law to pay his subcontractors for labor performed or materials furnished within forty-five (45) days after payment to such general or prime contractor.

- c. The contractor's attention is directed to Section 9 of the Agreement for additional requirements for Employment Preference and Minimum Wage.

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## A G R E E M E N T

This AGREEMENT, executed this 1<sup>st</sup> day of July in the year Two Thousand and \_\_\_\_ (20\_\_)

(herein referred to as the "AGREEMENT"), by and between the Town of Greenwich, Connecticut,

acting through Board of Education hereunto duly authorized "OWNER," and

\_\_\_\_\_ acting through \_\_\_\_\_  
duly authorized, "CONTRACTOR."

WITNESSETH, that the parties to these presents, each in consideration of the undertakings, promises, and agreements on the part of the other herein contained, have undertaken, promised, and agreed and do hereby undertake, promise and agree, the Owner for itself, its successors and assigns, as follows:

1. DEFINITIONS: Wherever the words hereinafter defined or pronouns used in their stead occur in the Contract Documents, they shall have the following meaning:

The word "OWNER" shall mean the Greenwich Board of Education, Town of Greenwich, and shall include its authorized representative, the Assistant Facilities Director.

The words "CONTRACTING OFFICER OR AGENCY" shall mean that official or agency of the Town which awards the contract and executed the Agreement.

The Invitation to Bid, Information for Bidders, the Contractor's Bid as accepted by the Owner, the Agreement, the General Conditions, any special conditions, and the General, Technical and Materials Specifications, the Drawings and all addenda and amendments to any of the foregoing, collectively constitute the Contract Documents, and are sometimes herein referred to as the "Contract".

When instructions such as "provide", "furnish", etc. are used herein, these apply to the General Contractor, unless noted otherwise.

2. DESCRIPTION OF WORK: The work under this Contract shall consist of everything set forth in the Specifications and any Drawings and any Addenda to either Specifications or Drawings or both. It shall be understood that the Contractor shall be in strict compliance with all municipal, state and federal statutes.
3. PAYMENT: The Contractor shall be paid, in general, upon satisfactory completion of the work as

described under "Final Payment". For certain work of substantial cost the Board of Education will make partial payments for work completed and materials provided. Requirements for partial payments are as stipulated in the Special Conditions.

Each requisition for partial payment must be accompanied with a breakdown showing costs of materials provided and percentage of the work which is completed at the time such request is made. Such payments will be made upon approval of the Assistant Facilities Director.

4. **PERFORMANCE, MAINTENANCE AND PAYMENT BOND:** The Contractor shall simultaneously with the signing of the Contract, furnish the Town the executed Performance, Maintenance, and Payment Bond of a SURETY COMPANY AUTHORIZED TO DO BUSINESS IN THE STATE OF CONNECTICUT, and acceptable to the Town, in the sum of the full amount of the Contract Obligation in the form provided by the Town. A **PERFORMANCE BOND** will not be required where the total estimated cost of labor and materials under the contract with respect to which such general bid is submitted is less than one hundred thousand dollars (\$100,000.00).
5. **TIME OF COMPLETION:** Where time of completion is an essential and applicable part of this Contract each Bidder will be required to indicate his proposed completion date as set forth on the Proposal Sheet. Where time is of the utmost importance because inconvenience, safety or health of persons affected or for any other valid reason as determined by the Board of Education, the Board will establish the time of completion and reserves the right to establish a time charge against the Contractor for non-compliance with this provision. Conditions for the time charge and related costs will be as set forth in the Specifications if such time charge will be made part of this Contract.

**NOTE: The Greenwich Public Schools, at its discretion, may choose to extend the Contract for additional option years.**

Base Contract period is:	2023	through	2024
First option year is:	2024	through	2025
Second option years is:	2025	through	2026

6. **INSURANCE:** Before starting and until final completion and acceptance of the work called for in the Contract and expiration of the guarantee period provided for in the Contract, the Contractor shall procure and maintain insurance of the types and amounts indicated in paragraphs A through F inclusive, below, and such other insurance as is specified under any special conditions to the Contract. The Town shall be named as an additional insured on each such policy of insurance.

The Contractor shall require each of its subcontractors to procure and maintain, until the final completion of each sub-contractor's work, insurance of the types and amounts specified in paragraphs A through F

inclusive, below, which shall be in addition to the obligation of the Contractor to secure and maintain at its expense, during the life of this Contract, public liability and property damage insurance to protect it, its sub-contractors, if any, and the Town from claims for bodily injury, accidental death or property damage arising from the operations under this Contract (including blasting and the handling and storage of explosives) whether such operations be by the Contractor or by anyone directly or indirectly employed by it.

7. GUARANTEE: The Contractor guarantees that the work and services to be performed, furnished, used or installed in the construction of the same shall be free of defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, if any, Specifications, and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the work as stated in the final estimate. The Contractor shall repair, correct or replace as required, promptly and without charge, all work, equipment and material, or parts thereof, which fail to meet the above guarantee or which in any way fail to be in strict accordance with the terms and provisions and requirements of the Contract during such one year period, and also shall cover maintenance/operation, repair, correct, or replace all damage to the work resulting from such failure.
8. DEFECTIVE WORK: The inspection of the work shall not relieve the Contractor of any of his obligations to perform and complete the work as required by the Contract. Defective work shall be corrected and unsuitable materials, equipment, apparatus and other items shall be replaced by the Contractor, notwithstanding that such work, materials, and other items may have been previously overlooked or accepted or estimated for payment. If the work or any part thereof shall be found defective at any time before the final acceptance of the work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Board of Education; if any material, equipment, apparatus, or other items brought upon the site for use or incorporation in the work, or selected for the same, is condemned by the Board of Education as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the work and shall at his own cost and expense make good and replace the same and any material furnished by the Board of Education which shall be damaged or rendered defective by the handling or improper installation by the Contractor, his agents, servants, employees or subcontractors.
9. EMPLOYMENT PREFERENCE AND MINIMUM WAGE RATES: In the employment of labor to perform the construction, remodeling or repairing of any public building specified herein, by the State or any of its agents, or by persons contracting therewith, preference shall be given to citizens of the United States, who are, and continuously for at least three months prior to the date hereof have been, residents of the labor market area, as established by the labor commissioner of the State of Connecticut, in which such work is to be done, and if no such qualified person is available, then to citizens who have continuously resided in the county in which the work is to be performed for at least three months prior to the date hereof,

and then to citizens of the state who have continuously resided in the state at least three months prior to the date hereof. In no event shall said provisions be deemed to abrogate or supersede, in any manner, any provision regarding residence requirements contained in a collective bargaining agreement to which the Contractor is a party.

In the employment of mechanics or workmen to perform the work specified herein, in connection with any public works project, including, but not limited to construction, remodeling or repairing of any public facility, structure, except public buildings covered by the preceding paragraph, site preparation or site improvement, appurtenances or highways or in preparation or improvement of any land or waterway on or in which a structure is situated or to be constructed by the state or any of its agents or by persons contracting therewith, preference shall be given to residents of the state who are, and continuously for at least six months prior to the date hereof have been, residents of this state, and if no such person is available then to residents of other states.

The provisions of the two immediately preceding paragraphs of this section shall not apply where the state or any subdivision thereof may suffer the loss of revenue granted or to be granted from any agency or department of the federal government as a result of the two immediately preceding paragraphs of this section or regulative procedures pursuant thereto.

The wages paid on an hourly basis to any mechanic, laborer, or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of such employee to any employee welfare fund, as defined in Section 31-53(h) Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the Town of Greenwich. Any Contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day.

The provisions of the immediately preceding paragraph shall not apply where the total cost of all work to be performed by all contractors and subcontractors in connection with new construction of any public works project is less than four hundred thousand dollars (\$400,000) or where the total cost of all work to be performed by all contractors and subcontractors in connection with any remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works projects is less than one hundred thousand dollars (\$100,000).

10. **COMPLIANCE WITH LAWS:** The Contractor shall keep himself fully informed of all existing and future federal, state and local laws, ordinances, rules and regulations affecting those engaged or employed on the work, the materials and equipment used in the work or the conduct of the work and of all orders, decrees and other requirements of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, if any, Specifications or other Contract

documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall at all times observe and comply with, and cause all his agents, servants, employees and subcontractors to observe and comply with all such existing and future laws, ordinances, rules, regulations, orders, decrees and other requirements, and he shall protect, indemnify and save harmless the Town, its officers, agents, servants, and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, penalties, losses, damages, costs, and expenses, including attorneys' fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule regulation, order, decree or other requirement, whether committed by the Contractor or any of his agents, servants, employees or subcontractors.

11. INDEMNITY: The Contractor shall indemnify and save harmless the Town and its officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damages to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the work, whether or not due to whole or in part to the active, passive or concurrent negligence or fault of the Contractor, his officers, agents, servants or employees, any of his subcontractors, the owner or any of his respective officers, agents, servants, or employees and whether or not such demands suits or proceedings are just, unjust, groundless, false, or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits, and proceedings; and provided that the Contractor shall not be required to indemnify the owner, his officers, agents, servants, or employees, against any such damages occasioned solely by acts or omissions of the owner other than supervisory acts or omissions of the owner in connection with the work.

Indemnity Against Subcontractors' Claims: If any other Contractor or any such other Contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the Contractor or of any of his subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other Contractor or subcontractor for such loss or damage. The Contractor agrees to and does hereby indemnify and save harmless the Town from and against any and all claims by such other Contractors and subcontractors, alleging such loss, damage, or delay and from and against any and all claims, demands, suits, expenses including attorneys' fees, arising out of, relating to or resulting from such claims.

12. PATENTS: The Contractor shall indemnify and save harmless the Town and all persons acting for or on behalf of the Town from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorneys' fees, arising from or occasioned by an infringement or alleged infringement of any patents or patent rights on any invention, process, materials, equipment, article, or apparatus, or any part hereof, furnished and installed by the Contractor, or arising from or occasioned by the use of manufacture thereof, including their use by the Town.

13. CHANGES: The Board of Education, through its designated Agent, may make changes in the work and in the Drawings, if any, and Specifications therefore by making alterations therein, additions thereto or omissions therefrom. All work resulting from such changes shall be performed and furnished under and pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefore. For eliminated or decreased work the Contractor shall allow the Board of Education a reasonable credit as determined by the Parties. Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Board of Education authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

The Contractor agrees that he shall neither have nor assert any claim for or be entitled to any additional compensation for changes or for loss of anticipated profits on work that is eliminated.

14. CLAIMS FOR DAMAGES: If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained whichever date is the earlier, file with the Assistant Facilities Director and the Contracting Officer a written, itemized statement of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Contracting Officer shall file with the Assistant Facilities Director one (1) copy of the statement, and shall file with the Assistant Facilities Director and the Contractor his determination thereon. The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction, instruction, determination or decision of the owner or its agents, nor shall any such claims be considered, unless the Contractor shall be complied in all respects with the provisions of this paragraph.
15. ABANDONMENT OF THE WORK OR OTHER DEFAULT: If the work shall be abandoned, or any part thereof shall be sublet without previous written consent of the GPS, or the Contract or any moneys payable hereunder shall be assigned otherwise than as herein specified or if at any time the Contracting Officer shall be of the opinion, and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the work or any part thereof is being unnecessarily or unreasonably delayed, or that the Consultant has violated or is in default under any of the provisions of the Contract, or if the Consultant becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an agreement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitutes a default under the Contract, the

Town/GPS may notify the Consultant in writing, with a copy of such notice mailed to the surety to discontinue all work or any part thereof; thereupon the Consultant shall discontinue such work or such part thereof as the Town/GPS may designate; and the Town/GPS may, upon giving such notice, by Contract or otherwise as it may determine, complete the work or such part thereof and charge the entire cost and expense of so completing the work, the Town/GPS shall be entitled to reimbursement from the Consultant and the Consultant agrees to pay to the Town/GPS any losses, damages, costs and expenses, including attorneys' fees, sustained or incurred by the Town/GPS by reason of any of the foregoing causes.

For the purpose of such completion the Town/GPS may for itself or for any Consultants employed by the Town/GPS take possession of and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the work.

All costs, expenses, losses, damages, attorneys' fees, and any and all other charges incurred by the Town/GPS under this subsection shall be charged against the Consultant and deducted and/or paid by the Town/GPS out of any moneys due and payable or to become due or payable under the Contract to the Consultant; in computing the amounts chargeable to the Consultant, the Town/GPS shall not be held to a basis of the lowest prices for which the completion of the work or any part thereof might have been accomplished, but all sums actually paid or obligated therefore to effect its prompt completion shall be charged to and against the account of the Consultant. In case the costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments theretofore made to or for the account of the Consultant, shall exceed the said sum, the Consultant shall pay the amount of the excess to the Town/GPS.

(I, We)\_\_\_\_\_ the undersigned having familiarized ourselves with the local conditions affecting the cost of the work and with Contract Documents and all addenda to said Documents, hereby propose to furnish all labor, tools, materials, equipment and insurance, to pay all applicable taxes, and to do and perform all things as provided in the Specifications, all in accordance with the Contract Documents.

The GPS shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the GPS with information and data for this purpose as the GPS may request. The right is reserved to reject any bid where, on investigation, the evidence or information submitted by such bidders does not satisfy the GPS that the bidder is qualified to carry out properly the terms of the contract.

The contract shall be awarded to the lowest responsible and qualified bidder, meaning the bidder whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary to the faithful performance of the work based on objective criteria considering past performance

and financial responsibility. In considering past performance, the Greenwich Public Schools shall evaluate the skill, ability and integrity of bidders in terms of the bidders' fulfillment of contract obligations and of the bidders' experience or lack of experience with projects of similar size and scope. The Greenwich Public Schools reserves the right to consider as unqualified to do the work required by the bid documents any bidder that does not habitually perform with its own forces the major portion of the work involved in the bid documents. No contract will be awarded to any bidder who is at the time of award not qualified under applicable regulations issued by the Secretary of Labor, United States Department of Labor or any applicable State and local laws and regulations.

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After review of all factors, terms and conditions, including price, the Greenwich Public Schools reserves the right to reject any and all bids, or any part thereof, or waive defects in same.

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The Greenwich Board of Education reserves the right to accept the bid or bids of the lowest qualified bidder, kind, quality and material being equal, to select a single item from the bidder, or to accept the bid as a whole; to reject any and all bids, and to waive any omission or informalities in any bid.

16. LIENS: If at any time notices of lien or other legal process are filed for labor performed or materials or equipment manufactured, furnished or delivered to or for the work, the Contractor shall, at its own cost and expense, promptly discharge, removal or disposition, the Board of Education shall have the right to retain any moneys payable hereunder so much thereof as, in its sole judgement, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce such claims or incurred in connection therewith or by reason thereof.
17. CLAIMS: If at any time there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Board of Education may retain from any moneys which would otherwise settle or otherwise dispose of such claims and to pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce such claims or incurred in connection therewith or by reasons thereof.

As required by Section 49-41a of the Connecticut General Statutes, within thirty days after payment from the Town for work under this Contract he shall pay any amounts due any subcontractor, whether for labor performed or materials furnished when such labor or materials has been included in a requisition submitted by such Contractor and paid by the Town.

18. LIABILITY OF TOWN: No person, firm or corporation, other than the Contractor who signed this Contract as such, shall have any interest herein or rights hereunder. No claim shall be made

or be valid either against the Board of Education or any agent of the Board of Education shall be liable for or be held to pay any money, except the final estimate shall operate as and shall be a full and complete release of any and all claims, demands and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the work or for or on account of any act or neglect of the Board of Education or of any agent of the Board of Education or of any other person, arising out of, relating to or by reason of the work, except the claim against the Board of Education for the unpaid balance, if any there be, of the amounts retained as herein provided.

19. PROVISIONS REQUIRED BY LAW DEEMED INSERTED: Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.
20. PERMITS: The Contractor shall, at his own expense, take out and maintain all necessary permits, including sewer and drainage permits from the State, Town or other public authorities; shall give all notices required by law; and shall post all bonds and pay all fees and charges incident to the due and lawful prosecution of the work.

Local building officials are required, before issuing any building permit pursuant to 29-263 C.G.S., to require proof of workers' compensation insurance coverage **for all persons** employed or engaged to perform services on the construction site, whenever the TOTAL cost of all work to be performed is \$100,000 or more.
21. NOT TO SUBLET OR ASSIGN: The Contractor shall constantly give his personal attention to the faithful prosecution of the work, shall keep the same under his personal control, shall not assign the Contract or sublet the work or any part thereof without the previous written consent of the Board of Education, and shall not assign any of the moneys payable under the Contract, or his claim thereto, unless by and with the like written consent of the Board of Education and the surety on the Contract Bonds. Any assignment or subletting in violation hereof shall be void and unenforceable.
22. EMPLOY COMPETENT WORKERS: The Contractor shall employ only competent workers on the project and shall not employ workers or means which may cause strikes, work stoppages, and/or disturbances by workers employed by the Contractor, and subcontractor, the Board of Education, the Contracting Officer or any other Contractor. Whenever the Contracting Officer notifies the Contractor in writing that in his opinion any worker on the project is incompetent, unfaithful, disorderly, or otherwise unsatisfactory or not employed in accordance with the provisions of the Contract, such worker shall be discharged from the project and shall not again be employed on it, except with the written consent of the Contracting Officer.

23. EMPLOY SUFFICIENT LABOR AND EQUIPMENT: If in the sole judgment of the Contracting Officer the Contractor is not employing sufficient labor, plant, equipment or other means to complete the work within the time specified the Contracting Officer may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Contracting Officer deems necessary to enable the work to progress properly.
24. INTOXICATING LIQUORS: The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the work.
25. ACCESS TO WORK: The Board of Education, the Contracting Officer, and their officers, agents, servants, and employees may at any and all times and for any and all purposes, enter upon the work and the site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefore.
26. EXAMINATION OF WORK: The Contracting Officer shall be furnished by the Contractor with every reasonable facility for examining and inspecting the work and for ascertaining that work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down portions of finished work by the Contractor.
27. EXTRA WORK: The Contractor shall perform any extra work (work in connection with the Contract but not provided for herein) when as ordered in writing by the Contracting Officer, at the unit prices stipulated in the Contract for such work or, if none are stipulated, either (a) at the price agreed upon before such work is commenced and named in the written order for such work, or (b) if the Contracting Officer so elects, by cost, based on determination of reasonable expenditures of labor and materials, as approved by the Contracting Officer, plus an allowance of **10 %** of the cost for combined overhead and profit
28. CHANGES NOT TO AFFECT BONDS: It is distinctly agreed and understood that any changes made in the work or the Drawings or Specifications therefore (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in manner or time of payment made by the Board of Education to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the surety on the Contract Bonds given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the surety on said bonds continue and remain in full force and effect.
29. PRICES FOR WORK: The Town shall pay and the Contractor shall receive the prices stipulated in the Bid made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

30. MONEYS MAY BE RETAINED: The Board of Education may at any time retain from any moneys, which would otherwise be payable hereunder, so much thereof as the Board of Education may deem necessary to complete the work hereunder and to reimburse it for all costs, expenses, losses, damages chargeable to the Contractor hereunder.
31. USE OR PARTIAL PAYMENT NOT ACCEPTANCE: It is agreed that this is an entire contract for one whole and complete work or result and that neither the Town's entrance upon or use of the work or any part thereof nor any partial payments by the Board of Education shall constitute an acceptance of the work or any part thereof before its entire completion and final acceptance.
32. PREVAILING WAGE RATES: CONSTRUCTION SAFETY AND HEALTH COURSE

Except as noted below, the Contractor shall comply with the current provisions of Section 31-53 of the General Statutes of the State of Connecticut, a part of which is quoted as follows.

"The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee or welfare fund, as defined in subsection (h) of section 31-53 of the General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day."

All Contractors and subcontractors shall submit certified weekly payrolls, on forms furnished by the Town, for all contracts meeting the aforementioned monetary limits. The certified payrolls shall be submitted with the Contractor's monthly certificate for payment.

Section 31-55a of the General Statutes of the State of Connecticut provides that the prevailing wage rates applicable to any awarded contract or subcontract are subject to annual adjustments each July 1<sup>st</sup> for the duration of the project.

Each Contractor that is awarded a contract shall pay the annual adjusted prevailing wage rate that is in effect each July 1<sup>st</sup>, as posted by the Department of Labor.

It is the Contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's web site. The annual adjustments will be posted on the Department's of Labor web page: [www.ctdol.state.ct.us](http://www.ctdol.state.ct.us). For those without Internet access, contact the division listed below.

The Contractor shall also furnish proof with the weekly certified payroll for the first week each employee begins work that any person performing the work of a mechanic, laborer or worker has completed a course of at least ten (10) hours in duration in construction safety and health approved by the federal Occupational

Safety and Health Administration in accordance with Connecticut General Statutes Section 31-53b and regulations adopted by the State of Connecticut Labor Commissioner.

The provisions of this section (4.48) shall not apply where the total cost of all work to be performed by all Contractors and subcontractors in connection with new construction of any public works project is less than four hundred thousand dollars (\$400,000) or where the total cost of all work to be performed by all contractors and subcontractors in connection with any remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project is less than one hundred thousand dollars (\$100,000).

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

33. NON-CONNECTICUT CONTRACTORS:

Pursuant to Connecticut General Statutes Section 12-430(7), as amended by Connecticut Public Act #11-61, Section 66, a non-resident contractor shall comply with the State of Connecticut's bonding requirements.

34. FINAL PAYMENT: When the Contractor has completed the work under this Contract he shall submit his bill for final payment to the Assistant Facilities Director for approval. The bill shall be submitted on the Contractor's billhead indicating date, contract number, work performed, and amount of bill along with an executed Affidavit for Final Payment which is part of the Contractor's conformed copy of the Contract.

Receipt of this bill shall in no way obligate the Board of Education to accept the work under this Contract as complete and satisfactory.

Within one week from date of receipt of the bill, the Assistant Facilities Director or his representative will inspect the work and if deficiencies are found the Contractor shall be notified in writing of each deficiency. The final payment shall not be made until the Assistant Facilities Director approves the work as complete, satisfactory and in compliance with the Contract Document.

35. RIGHT TO ALTER FORM, QUANTITY, ETC., OF WORK: The Board of Education further reserves the right to make alterations in the lines, grade, plan, the commencement of work because of the priority restrictions, insufficient funds in appropriations, or other cause. If such alterations diminish the quantity of the work to be done, they shall not constitute a claim for damage, or for anticipated profits on the work dispensed with, or affect the prices bid for the various classes of work remaining. If they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price or prices bid for various classes of work, or if not susceptible of classification, to so agree, the Contractor shall do the work as aforesaid as extra work.

36. SAFETY SPECIFICATIONS

Site Conduct: Contractor acknowledges that the Work will be conducted at an operating public school, which may inhibit the operations of Contractor and its Subcontractors and Vendors. Parking for workers, vendors, and visitors will be allowed only at an area designated by Owner.

If necessary, Contractor shall provide transportation for all workers between the Site and such remote parking as will be provided to the Contractor. Contractor shall prohibit, and shall use all reasonable efforts to prevent its, and its Subcontractors' and Vendors', personnel from loitering or wandering in the School. Contractor shall also prohibit, and shall use all reasonable efforts to prevent, on or near the Site, the use or consumption of alcoholic beverages, drugs, or other mind-altering substances, the carrying of firearms or other weapons, fighting, and conduct that is disorderly, or disruptive, in a business setting. Contractor shall promptly terminate, or have terminated, the employment of any person employed by Contractor, or a Subcontractor or Vendor, whose employment Owner designates to be terminated due to violation of any laws or rules applicable to the site or the school.

Safety: The safety of Contractor, Subcontractors, Vendors and their employees, agents, representative and invitees, and any other person who enters the Site for any purpose relating to Contractor's carrying out its obligations under this Agreement (including Owner and its employees, agents, representatives and invitees) shall be Contractor's responsibility. Contractor shall promptly notify Owner, in writing, of any hazardous conditions, property or Equipment at the Site. If Owner requests that Contractor provide certain safeguards required in Owner's reasonable judgment for the protection of persons, or property, on or near the Site and Contractor fails to comply with such request within a reasonable time, Owner may provide such safeguards, and Contractor shall promptly reimburse Owner for the costs thereof. Such provision by Owner shall not relieve Contractor of its obligations or liabilities hereunder, nor shall it make Owner responsible for Site safety or Contractor's means and methods to ensure Site safety. Contractor shall initiate and maintain safety precautions and programs to conform with applicable laws and otherwise to protect against and prevent injury to persons or damage to property on, about, or adjacent to the Site and shall incorporate all such safety precautions and programs (the "Site Safety Program") in a written safety program manual (the "Site Safety Manual"). Contractor shall erect and maintain safeguards for the protection of workers and the public consistent with its obligations under the Agreement. Contractor shall exercise efforts to eliminate, or abate, all reasonably foreseeable safety hazards created by or otherwise resulting from performance of the Work. Contractor shall ensure that it, its employees, agents and invitees and its Subcontractors, Vendors and their employees, agents and invitees, during performance of any of the Work, comply with (i) all applicable laws relating to health and safety, including the Occupational Safety and Health Act of 1970 (OSHA) and the rules and regulations promulgated thereunder, and (ii) all directions by Owner regarding protective clothing, head covering, eye protection, and the like. Prior to commencing Work, Contractor or designate to Owner (i) one of its employees to act as the Site's safety officer (the "Site Safety Officer") and

(ii) certain of its employees to act as the Site's first aid staff, which employees shall be properly trained and qualified. Contractor's Site Safety Officer shall attend and pass Owner's fire watch training session, or a similar session, with advance approval by Owner. Contractor shall not terminate the employment of the Site Safety Officer without Owner's prior written consent. Contractor's Site Safety Officer and first aid staff shall have such responsibilities as Owner and Contractor may from time to time agree. Owner may from time to time designate its own Site safety officer or first aid staff to whom Contractor's Site Safety Officer and staff shall report.

Safety Records: Contractor shall furnish the safety records of Contractor and its Subcontractors, including their experience modification rate, OSHA Injury Index, OSHA Days Away From Work Index.

Hot Work Permits: At least twenty-four (24) hours in advance of performing Work in Hazardous Areas, Contractor's Representative shall notify General Contractor that such work is necessary, obtain General Contractor's prior written approval to perform such work, and, if approved, provide General Contractor with Hot Work Maps and obtain Hot Work Permits from General Contractor's Representative.

Daily Safe Work Permits: On a daily basis, prior to performing any Work, Contractor shall obtain Daily Safe Work Permits from the Owner.

Differing Site Conditions: Contractor shall, promptly after actual discovery, and before such conditions are disturbed (to the extent reasonably practicable), notify Owner in writing of (i) any subsurface or latent physical conditions at the Site, differing materially from those indicated in, or reasonably inferable from, the Supplied Project Documents that could not have been observed through a reasonable inspection of the Site, prior to commencing Work, or (ii) unknown physical conditions at the Site of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Agreement. After receipt of such notice, Owner shall promptly investigate the conditions. In the event that such conditions do materially differ and actually result in a material increase or decrease in Contractor's cost of, or the time required for performance of, the Work, Contractor may be entitled to additional or a reduction in compensation under Agreement as applicable. No adjustment in compensation shall be allowed under this Paragraph unless Contractor has promptly given the notice required in this Paragraph.

Site Housekeeping: Contractor shall keep the Site free from trash, contamination, refuse, rubbish, scrap materials, and debris caused, or created by, Contractor or its Subcontractors and shall keep the Site in a reasonably presentable condition given the nature of the Work and in a neat, orderly, and workmanlike apace. Owner may from time to time instruct Contractor to place the Site in such condition. If Contractor fails to do so within a reasonable period of time, Owner may do so and charge Contractor for the actual cost thereof. Contractor shall dispose of trash, refuse, rubbish, scrap material, and debris in an authorized

landfill. Contractor shall not burn, or bury, any such items. Contractor shall cause all Contractor generated Hazardous Substances that are transported by Contractor to the Site to be disposed of by licensed transporters in accordance with the requirements of all applicable laws.

Maintenance of Roadways: Contractor shall protect all maintained roads, driveways, and bridges which may be damaged in connection with the work, and shall repair, or replace, them if damaged, at its own expense, to the satisfaction of the governmental authorities or Owner. It is the responsibility of the Contractor to identify the potential for damage and take proper preventative measures to prevent damage to maintained or unmaintained roads, drives, or bridges. Cost of preventative measures shall be submitted to Owner, prior to commencement of work and will be on a reimbursable basis. Contractor shall not block any main thoroughfares in School property without prior approval from Owner. No lug type rigs, bulldozers, or other tract type equipment may be used without prior approval from the Owner. If these rigs are used, appropriate protection must be used to prevent damage to roadways.

Clean-Up: As part of the work included in this Contract, the Contractor shall completely remove and satisfactorily dispose of all temporary buildings placed by the Contractor; shall remove or grade, to the extent directed, all embankments or cofferdams made for construction purposes; shall satisfactorily dispose of all rubbish resulting from the operations under this Agreement; and shall do all work necessary to restore the territory embraced within the site of its operations to at least as good order and conditions at the beginning of the work under this contract. Notwithstanding the foregoing, any work concerning Hazardous Substances shall be performed only in accordance with the contract and all applicable laws.

Training and Operations Manuals: Contractor shall provide, either itself or through its subcontractors or vendors, specific operations and maintenance training to Owner's personnel for the Equipment and systems that Contractor provides. As to such Equipment and systems, Contractor shall provide to Owner final operations manuals, record drawings, specifications, priced spare parts lists and design sheets.

IN WITNESS WHEREOF, the parties of this AGREEMENT have hereunto set their hands and seals the day first above written.

TOWN OF GREENWICH, CONNECTICUT

BY \_\_\_\_\_ Benjamin B. Branyan  
Contracting Officer Managing Director of Operations

Date: \_\_\_\_\_

CONTRACTOR

BY \_\_\_\_\_

Date: \_\_\_\_\_

(Corporate Seal)

**CONSENT OF SURETY**

The undersigned surety, being the surety company which issued Bond No. \_\_\_\_\_ for the Town of Greenwich Contract No. \_\_\_\_\_ hereby consents to release of final payment and all retainages to the contractor – principal.

(Name of Surety)

By \_\_\_\_\_

Its

**ACKNOWLEDGMENT**

**STATE OF**

**SS:**

**COUNTY OF**

This is to certify that the above named signatory who executed this instrument was either known to me or satisfactorily proven to me to be the person whom he purports to be.

---

**Notary Public**

## AFFIDAVIT FOR FINAL PAYMENT

The undersigned, being duly sworn, deposes and says:

1. That he is the \_\_\_\_\_ (Title) of the contractor in the project hereinafter referred to and is authorized to execute this affidavit on behalf of the contractor;
  
2. In connection with Contract #\_\_\_\_\_ for \_\_\_\_\_  
(Project Title) it is represented that all payrolls, bills for services, materials, supplies, equipment and other indebtedness have been paid or otherwise satisfied and that there are no outstanding claims against the undersigned by any sub-contractor or material supplier, or no outstanding claims or intent to file a claim against the Town of Greenwich;
  
3. This Affidavit is made at the request of the Town of Greenwich for the purpose of inducing final payment and knowing that it will rely upon the truth of the representation herein made.

Subscribed and sworn to  
before me this     day  
of                      2023

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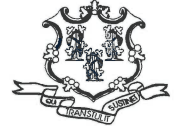
Notary Public

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(Type or print name of person  
authorized to sign)

Department of Revenue Services  
State of Connecticut  
Attn: Discovery Unit  
25 Sigourney Street  
Hartford CT 06106-5032  
(New 09/03)

**Form AU-764**  
**Deposit by a Person Doing Business**  
**With a Nonresident Contractor**



**Purpose:** A person doing business with a nonresident contractor uses **Form AU-764** to deposit 5% of the total contract price with the Department of Revenue Services (DRS) for a specific project in the state. The deposit ensures all taxes due to the State of Connecticut from the contractor are paid to DRS. Read the instructions on the reverse side before you complete this form. If you need help, call **860-541-3280**, Monday through Friday, 8:00 a.m. to 5:00 p.m., and choose Option 7.

**Part I: Nonresident Contractor Information**

Name	Connecticut Tax Registration No.
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Address (Street or PO Box, City, State, and ZIP Code)

**Part II: Person Doing Business With a Nonresident Contractor Information**

Name	Connecticut Tax Registration No., Federal ID No., or SSN
------	--

Address (Street or PO Box, City, State, and ZIP Code)

**Part III: Project Information**

Physical Location of Project (Street, City or Town)	Name of Project
---	-----------------

Commencement Date	Completion Date for Nonresident Contractor	Total Contract Price or Amount of Change Order <input type="checkbox"/> Check the box if this deposit is for a change order	Amount of Deposit
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Conditions of the deposit for the project detailed above:

- The nonresident contractor has entered into a contract related to real property at a Connecticut location.
- The person doing business with the nonresident contractor is depositing 5% of the total contract price with DRS to ensure all taxes that become due and owing during the period of the contract will be paid.
- The deposit is made within 30 days of the completion of the project.
- The deposit will be returned to the nonresident contractor upon written request by the contractor after DRS has examined its records and determined all taxes, interest, and penalties due during the term of the contract have been paid.
- The person doing business with the nonresident contractor must attach a copy of the final periodic billing to **Form AU-764**.

**Declaration:** I, an authorized agent of the person doing business with a nonresident contractor named above, declare under the penalty of law that I have examined **Form AU-764** and, to the best of my knowledge and belief it is true, complete, and correct. I understand the penalty for willfully delivering a false document or return to DRS is a fine of not more than \$5,000, or imprisonment for not more than five years, or both.

Print Name	Title
------------	-------

Authorized Signature	Date
----------------------	------

**Receipt of Deposit:** DRS acknowledges receipt of \$ \_\_\_\_\_ from the person named above as doing business with a nonresident contractor related to real property at the Connecticut location noted above.

Signature of Authorized DRS Representative	Telephone	Date
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## General Instructions

A person doing business with a nonresident contractor working in Connecticut must submit **Form AU-764, *Deposit by a Person Doing Business With a Nonresident Contractor***, with a deposit of 5% of the total contract price, including change orders and add-ons, not later than 30 days after the completion of the contract. This applies to all contracts with nonresident contractors, regardless of the nature of the real property affected or the tax-exempt status of the property owner. For more information, see **Special Notice 2003(20), *Legislation Affecting Contracts With Nonresident Contractors***.

A *nonresident contractor* is a contractor who does not maintain a regular place of business in this state. A *regular place of business* means any bona fide office, factory, warehouse, or other space in Connecticut at which a contractor is doing business in its own name in a regular and systematic manner, and which place is continuously maintained, occupied, and used by the contractor in carrying on its business through its employees regularly in attendance to carry on the contractor's business in the contractor's own name. A regular place of business does not include a place of business for a statutory agent for service of process or a temporary office whether or not it is located at the site of construction. A regular place of business also does not include locations used by the contractor only for the duration of the contract, such as short-term leased offices, warehouses, storage facilities, or facilities that do not have full time staff with regular business hours. An office maintained, occupied and used by a person affiliated with a contractor is not a regular place of business of the contractor.

## Specific Instructions

**Part I:** Enter the name and complete address of the nonresident contractor on whose behalf the deposit is being made. Include the nonresident contractor's Connecticut tax registration number.

**Part II:** Enter the name and complete address of the person doing business with the nonresident contractor. If the nonresident contractor is the general contractor, enter the name and address of the owner of the property. If the nonresident contractor is a subcontractor, enter the name and address of the general contractor.

Enter the Connecticut tax registration number of the person doing business with the nonresident contractor. If the person doing business with the nonresident contractor does not have a Connecticut tax registration number, enter that person's Federal Employer Identification Number or Social Security Number.

**Part III:** Enter the name of the project and the complete address, including the street address and the city or town where the project is physically located.

Enter the commencement date of this project. The commencement date is the date the contract is signed or the date the nonresident contractor begins work on the project, but it is never later than the date the nonresident contractor begins work.

Enter the date on which work on this project was completed, which is the date the final periodic billing for the contract was made by the nonresident contractor. Note the final periodic billing may be due before payment of any retainage becomes due. The person making the deposit must attach a copy of the final periodic billing to **Form AU-764**.

If this is a deposit for a change order occurring after the deposit for the initial contract has been remitted to DRS, enter the additional amount being deposited for the change order and check the box. For a change order made after the final periodic billing for the original contract, the change order is deemed complete when it is billed by the nonresident contractor. Attach a copy of the final billing for the change order.

Enter, in words and figures, the total amount paid to the nonresident contractor under the contract or for the change order. Check the box if the deposit is for a change order.

Multiply the total contract price or the amount of the change order by 5% (.05) and enter the result on this line.

**Declaration:** An authorized representative of the person doing business with a nonresident contractor must sign and date the declaration. Return **Form AU-764**, with the copy of the final periodic billing, to:

Department of Revenue Services  
State of Connecticut  
Discovery Unit  
25 Sigourney Street  
Hartford CT 06106

**Receipt:** DRS will acknowledge receipt of the deposit by completing the bottom of Form AU-764 and returning a copy of it to the person making the deposit. Unless indicated otherwise, the person doing business with the nonresident contractor will not be liable for any claim of the nonresident contractor for the amount or for any claim of DRS for any taxes arising from the activities of the nonresident contractor on the project for which the bond deposit was made, once DRS has verified that total deposits represent 5% of the total contract price paid to the nonresident contractor for this project, including any change orders, and that the deposit is made within 30 days of completion of the project.

## Instructions for Form REG-1 Business Taxes Registration Application

### Purpose of Form REG-1

Use Form REG-1 to obtain a Connecticut tax registration number or to register for additional tax types under your current Connecticut tax registration number.

Use Form REG-1 to register for any of these taxes:

- Business entity tax
- Business use tax
- Corporation business income tax (including PIC)
- Income tax withholding
- Prepaid wireless E 9-1-1 fee
- Room occupancy tax
- Sales and use taxes
- Unrelated business income tax

In addition to Form REG-1, you must complete and attach the appropriate addendum to register for any of the taxes noted below. Visit the Department of Revenue Services (DRS) website at [www.ct.gov/DRS](http://www.ct.gov/DRS) to preview and download forms.

#### REG-1 Addendum A

- Cigarette taxes
- Tobacco products tax

#### REG-1 Addendum B

- Admissions and dues taxes
- Dry cleaning surcharge
- Rental surcharge
- Tourism surcharge

#### REG-1 Addendum C

- Motor fuels tax
- Petroleum products gross earnings tax

#### REG-1 Addendum D

- Alcoholic beverages tax

#### REG-1 Addendum E

- Bottle deposit initiator
- Certified competitive video service provider companies tax
- Community antenna television system companies tax
- Electric generation
- Nursing home provider
- Railroad companies tax
- Satellite companies tax
- Solid waste assessment
- Suppliers of natural gas
- Utility companies tax

### Registering for Other Tax Types

To register for these taxes, use the form listed:

- Authority to Collect Use Tax ..... **REG-7**
- International Fuel Tax Agreement (IFTA) ..... **CT-IFTA-2**
- Motor Carrier Road Tax ..... **REG-3MC**

For information on registering with DRS, visit the DRS website at [www.ct.gov/DRS](http://www.ct.gov/DRS) or call **1-800-382-9463** (Connecticut calls outside the Greater Hartford calling area only) or **860-297-5962** (from anywhere).

### How to Register

#### Online Registration

You may register for most taxes online using the **Taxpayer Service Center (TSC)**. If you register online and there is a fee, you must make direct payment from your savings or checking account. Credit card payments are not accepted. If you register for sales tax, room occupancy tax, or as an over-the-counter cigarette dealer (retailer), a temporary permit will be available to print immediately. Be sure to print a copy of the temporary permit for your records. Once you have the temporary permit you may begin using it immediately. After you complete the registration, you will receive a confirmation number which serves as an official acknowledgement that your application has been received by DRS and acts as your temporary tax identification number. You will receive your registration package with your permanent Connecticut tax registration number in approximately ten business days.

If you are registering for a tax type that requires you to attach Addendum B to the REG-1 or if you are registering as a cigarette retailer (included on Addendum A), you may register online. If you are registering for another tax type that requires you to attach Addendum A, C, D, or E to the REG-1, you must register by mail or in person at the DRS office in Hartford.

#### Mail-In Registration

Complete Form REG-1 and mail it to DRS at:  
Department of Revenue Services  
PO Box 2937  
Hartford CT 06104-2937

If you owe a registration fee, you must include payment by check or money order with the application. You will receive your Connecticut tax registration number in the mail in **two to three weeks**.

#### Walk-In Registration

You may file Form REG-1 in person at any of the DRS offices:

Bridgeport - 10 Middle Street  
Hartford - 25 Sigourney Street  
Norwich - 401 West Thames Street, Building #700  
Waterbury - 55 West Main Street, Suite 100

You will be issued a Connecticut tax registration number **immediately**. Bring photo identification, such as a driver's license, and cash, a check, or a money order if you owe a registration fee. DRS does not accept credit or debit cards.

The application must be signed by the individual owner, partner, officer of the corporation, member of the limited liability company, or another who has an executed Power of Attorney with the authority to sign. If anyone other than the owner brings the signed application to the office and wants to obtain the registration for the owner, he or she must have written authorization from the owner to obtain the registration on his or her behalf.

### Electronic Filing Methods for Certain Tax Forms

Once you are registered with DRS, you may file certain tax forms by Internet or telephone using the DRS **Taxpayer Service Center (TSC)** program. Look for this logo.



## Who Needs to Complete Form REG-1

Businesses must register with the Connecticut DRS if they:

- Have people working in Connecticut;
- Withhold Connecticut income tax;
- Carry on a business in Connecticut;
- Are a corporation, S corporation, LLC, SMLLC, LP, or LLP formed under Connecticut law;
- Are a non-Connecticut corporation, S corporation, LLC, SMLLC, LP, or LLP required to register with or to obtain a certificate of authority from the Connecticut Secretary of the State;
- Provide taxable services in Connecticut;
- Are a loan-out company providing services in Connecticut;
- Sell, rent, or lease goods in Connecticut (wholesale or retail);
- Furnish space for storage of tangible personal property;
- Have a manufacturing facility in Connecticut;
- Serve meals or beverages in Connecticut;
- Purchase taxable goods or services for use in Connecticut;
- Provide lodgings in Connecticut subject to the room occupancy tax;
- Carry on a business as a corporation in Connecticut;
- Distribute alcoholic beverages in Connecticut;
- Distribute motor fuel used to propel motor vehicles on public highways or roads in Connecticut;
- Sell petroleum products in Connecticut;
- Operate a place of amusement, entertainment, or recreation in Connecticut;
- Operate a social, health, athletic, or sporting club in Connecticut;
- Sell or distribute cigarettes or tobacco products in Connecticut;
- Own, lease, maintain, operate, manage, or control a community antenna television system in Connecticut;
- Provide satellite television services to Connecticut;
- Provide video service under a certificate of video franchise authority issued by the Connecticut Public Utility Regulatory Authority formerly known as the Department of Public Utility Control;
- Operate a railroad in Connecticut on a for-profit basis;
- Are a resources recovery facility in Connecticut;
- Market natural gas to an end user in Connecticut;
- Provide distribution or transmission services for electricity in Connecticut;
- Sell electricity as a municipality to customers in Connecticut;
- Manufacture, sell, or distribute gas to be used for light, heat, or power in Connecticut;
- Operate a dry cleaning establishment in Connecticut.
- Are the first distributor to collect the deposit on a beverage container sold to any person within Connecticut;
- Are a nursing home provider;
- Provide electric generation services and upload electricity to the regional bulk power grid at their electric generation facility in Connecticut; or
- Sell prepaid wireless telecommunications service in Connecticut.

## Filing Requirements for State Taxes

Visit the DRS website at [www.ct.gov/DRS](http://www.ct.gov/DRS) to preview and download the **Informational Publication**, *Getting Started in Business*.

## Registration Fees

Sales and use taxes .....	\$100
Room occupancy tax* .....	\$100
Cigarette dealer's license .....	\$50
Cigarette distributor's license .....	\$1,250
Cigarette distributor chain operator	
5 to 14 retail locations .....	\$315
15 to 24 retail locations .....	\$625
25 or more retail locations.....	\$1,250
Cigarette manufacturer .....	\$5,250
Distributor of tobacco products .....	\$200

\* No fee is required for room occupancy tax if you are registered or are registering for sales and use taxes.

## Other Connecticut Licensing Requirements

Visit [www.ct-ctic.com](http://www.ct-ctic.com) for information on other Connecticut licensing requirements.

## How to Get Help

Visit the DRS website at [www.ct.gov/DRS](http://www.ct.gov/DRS) and click on *Businesses*.

Personal assistance is available by telephone or at the DRS office at 25 Sigourney Street in Hartford, Monday through Friday, during business hours.

CONN-TAX, the DRS telephone information line, is available anytime.

- **1-800-382-9463** (Connecticut calls outside the Greater Hartford calling area only); or
- **860-297-5962** (from anywhere).

**TTY, TDD, and Text Telephone users only** may transmit inquiries anytime by calling 860-297-4911.

Additional forms and publications are available anytime. Visit the DRS website at [www.ct.gov/DRS](http://www.ct.gov/DRS) to download and print Connecticut tax forms and publications.

## Application Instructions

Complete the entire application unless the section instructions indicate otherwise. Answering **Yes** to any question in Sections 7 through 12 means you may have a Connecticut tax liability for that tax. In each section where you answer **Yes** to any question, you must indicate the date you first incurred a tax liability in Connecticut for that tax type.

### Exceptions:

- Taxpayers with a valid Connecticut tax registration number who wish to register for another tax must complete Sections 1 through 6, Section 14, and the section for the specific tax type(s) for which you wish to register. See the section *Purpose of Form REG-1* on Page 1 of these instructions to determine if you have to complete an addendum to Form REG-1.
- Household employers who pay wages to and intend to withhold Connecticut income tax for housekeepers, nannies, health aides, caretakers, etc. – complete Sections 1 through 7 and 14 only.

# Form REG-1

## Business Taxes Registration Application

### 1. Reason for Filing Form REG-1

 Check the applicable box:

DRS use only Connecticut Tax Registration Number

- ☐ Opening a new business including but not limited to:
- a. An existing out-of-state business opening a location in Connecticut;
  - b. Selling at a craft show, flea market, fair, or other venue in Connecticut or selling over the Internet; **or**
  - c. An existing out-of-state business having employees in Connecticut (including nonresident contractors and loan-out companies).
- ☐ Opening a new location. **Enter your Connecticut Tax Registration No.:** \_\_\_\_\_
- ☐ Registering for additional taxes. **Enter your Connecticut Tax Registration No.:** \_\_\_\_\_
- ☐ Reopening a closed business.  
**Enter Connecticut Tax Registration No. of the closed business:** \_\_\_\_\_
- ☐ Purchasing an ongoing business. The buyer of an existing business may be responsible for tax liabilities of the previous owner. See the Informational Publication on Successor Liability for Sales and Use Taxes, Admissions and Dues Tax, and Connecticut Income Tax Withholding, on the DRS website.  
**Enter Connecticut Tax Registration No. of the previous owner:** \_\_\_\_\_
- ☐ Forming a business entity under Connecticut law or a non-Connecticut entity required to register with or to obtain a certificate of authority from the Connecticut Secretary of the State before transacting business in Connecticut.
- ☐ Establishing a passive investment company (PIC).
- ☐ Changing organization type. **Enter your current Connecticut Tax Registration No.:** \_\_\_\_\_
- ☐ Hiring household employees and intend to withhold Connecticut income tax.
- ☐ Other (explain); see *Who Needs to Complete REG-1*. \_\_\_\_\_

### 2. Business Information:

 Type of organization

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Sole proprietorship                        | <input type="checkbox"/> Single member LLC (SMLLC)                                 | <input type="checkbox"/> Corporation                              |
|   | <input type="checkbox"/> Single member LLC taxed as a corporation                  | <input type="checkbox"/> S Corporation                            |
| <input type="checkbox"/> General partnership                        | <input type="checkbox"/> Single member LLC taxed as an S corporation               | <input type="checkbox"/> Qualified subchapter S subsidiary (QSSS) |
| <input type="checkbox"/> Limited liability partnership (LLP)        | <input type="checkbox"/> Limited liability company (LLC) taxed as a partnership    |   |
|   | <input type="checkbox"/> Limited liability company (LLC) taxed as a corporation    |   |
| <input type="checkbox"/> Limited partnership (LP)                   | <input type="checkbox"/> Limited liability company (LLC) taxed as an S corporation |   |
| <input type="checkbox"/> Limited partnership taxed as a corporation | <input type="checkbox"/> Other (explain): _____                                    |   |

### 3. Nature of Business Activity

Check the box(es) that best describe your business:

- ☐ Retailer ☐ Wholesaler ☐ Manufacturer ☐ Service provider ☐ Other (explain): \_\_\_\_\_

### 4. Major Business Activity

Describe your major business activities: \_\_\_\_\_

### 5. Business Name and Address

Organization name: Enter the name of the sole proprietor, partnership, corporation, or LLC.		Federal Employer Identification Number, if applicable
Business trade name		CT Secretary of the State Business ID No., if applicable
Business Location: Enter the physical address of the business. A post office box or rural route number is not acceptable. Home-based businesses and flea market or craft show vendors must enter a home address.		
Address line 1		Address line 2
City	State	ZIP code
Mailing address line 1 (Street or PO Box)		Address line 2
City	State	ZIP code
Business telephone number	Email address	Bank name

**6. List All Owners, Partners, Corporate Officers, or LLC Members** Attach a separate sheet if needed.

Name (last, first, middle initial)			Title
Home address line 1 (street)		Home address line 2	
City	State	ZIP code	Home telephone number
SSN	Date of birth	Bank name	

Name (last, first, middle initial)			Title
Home address line 1 (street)		Home address line 2	
City	State	ZIP code	Home telephone number
SSN	Date of birth	Bank name	

Name (last, first, middle initial)			Title
Home address line 1 (street)		Home address line 2	
City	State	ZIP code	Home telephone number
SSN	Date of birth	Bank name	

Name (last, first, middle initial)			Title
Home address line 1 (street)		Home address line 2	
City	State	ZIP code	Home telephone number
SSN	Date of birth	Bank name	

**7. Income Tax Withholding**

Are you an employer that transacts business or maintains an office in Connecticut and intends to pay wages to resident employees or nonresident employees who work in Connecticut?..... ☐ Yes ☐ No

If you have a Connecticut tax registration number for withholding for another location and intend to file withholding for this new location under that number, enter that number here: \_\_\_\_\_ and skip to Section 8; otherwise continue.

Are you an out-of-state company voluntarily registering to withhold Connecticut income tax for your Connecticut resident employees who work outside of Connecticut?..... ☐ Yes ☐ No

Do you intend to withhold Connecticut income tax from pension plans, annuity plans, retirement distributions, or gambling distributions? ..... ☐ Yes ☐ No

Do you pay nonresident athletes or entertainers for services they render in Connecticut? ..... ☐ Yes ☐ No

Do you only have household employees and wish to withhold Connecticut income tax? ..... ☐ Yes ☐ No

Do you only have agricultural employees and wish to withhold Connecticut income tax? ..... ☐ Yes ☐ No

If **Yes**, do you file federal Form 943, Employer's Annual Tax Return for Agricultural Employees, and wish to file **Form CT-941**, *Connecticut Quarterly Reconciliation of Withholding*, annually? .... ☐ Yes ☐ No

If you answered **Yes** to any of the income tax withholding questions, enter the date you will start withholding Connecticut income tax. ....           /           /          

If you use a payroll service, enter the name of the payroll company: \_\_\_\_\_

**8. Sales and Use Taxes**Do you sell, or will you be selling, goods in Connecticut (either wholesale or retail)? ☐ Yes ☐ NoDo you rent equipment or other tangible personal property to individuals or businesses in Connecticut? ☐ Yes ☐ NoDo you serve meals or beverages in Connecticut? ☐ Yes ☐ NoDo you provide a taxable service in Connecticut? See the Informational Publication, *Getting Started in Business, and the Special Notice on Legislative Changes Affecting the Sales and Use Taxes*, on the DRS website, for a list of taxable services. ☐ Yes ☐ NoIf you answered **Yes** to any of the sales and use taxes questions, **enter the date** you will start selling or leasing goods or taxable services.  m  m  d  d  y  y**8a Prepaid Wireless Service E 9-1-1**Do you sell prepaid wireless service in Connecticut? ☐ Yes ☐ NoIf you answered **Yes**, **enter the date** you will start to sell these in Connecticut.  m  m  d  d  y  y**9. Room Occupancy Tax**Do you provide lodging rooms for rent in a hotel, motel, or rooming house in Connecticut for 30 consecutive days or less? ☐ Yes ☐ NoIf you answered **Yes**, **enter the date** you will start to provide rooms for rent for lodging purposes in Connecticut.  m  m  d  d  y  y**10. Business Entity Tax** Do not complete this section if the entity is liable for the corporation business tax.The **business entity tax** applies to all of the following business types formed under Connecticut law and to those non-Connecticut entities required to register with or obtain a certificate of authority from the Connecticut Secretary of the State before transacting business in the state, whether or not the business has registered or filed a certificate of authority, as the case may be, with the Connecticut Secretary of the State.

- S corporations (Qualified subchapter S subsidiaries (QSSS) are not liable for the business entity tax.);
- Limited liability companies (LLCs or SMLLCs) — any limited liability company that is, for federal income tax purposes, either:
- Treated as a partnership if it has two or more members; or
- Disregarded as an entity separate from its owner if it has a single member;
- Limited liability partnerships (LLPs); and
- Limited partnership (LPs).

Are you a business entity as described above? ☐ Yes ☐ No  
Enter state you are organized under:  Enter date of organization.  m  m  d  d  y  yIf not organized in Connecticut, enter the earlier of the date you started business in Connecticut or the date you registered with the Connecticut Secretary of the State.  m  m  d  d  y  yEnter the month your tax year closes: **11. Corporation and Unrelated Business Income Taxes****Corporation Business Tax** Do not complete this section if the entity is liable for the business entity tax.Are you a corporation? ☐ Yes ☐ NoAre you an LLC, SMLLC, or other association taxed as a corporation? ☐ Yes ☐ NoIs this corporation exempt from federal income tax? ☐ Yes ☐ NoHave you received a determination from the Internal Revenue Services (IRS) that this corporation is exempt from federal income tax? ☐ Yes ☐ NoIf **Yes**, enclose a copy of your IRS letter of determination.Enter state you are organized under:  Enter date of organization.  m  m  d  d  y  yIf not a Connecticut corporation, enter the earlier of the date you started business in Connecticut or the date you registered with the Connecticut Secretary of the State.  m  m  d  d  y  yEnter the month the corporate year closes: **Unrelated Business Income Tax**Are you a federally exempt organization that has unrelated business income attributable to a trade or business in Connecticut? ☐ Yes ☐ NoIf you answered **Yes**, **enter the date** the unrelated business income tax liability started.  m  m  d  d  y  y**Passive Investment Company (PIC)**Is this corporation a passive investment company as defined in Conn. Gen. Stat. §12-213(a)(27)? ☐ Yes ☐ No**Enter the date the PIC was organized.**  m  m  d  d  y  yEnter Connecticut tax registration number of the PIC's related financial service or insurance company:

## 12. Business Use Tax

If you are registered for or are registering for sales and use taxes, you do not need to complete this section.

Business use tax is due when a business purchases taxable goods or services including the purchase or lease of assets, consumable goods, and promotional items, for use in Connecticut without paying Connecticut sales tax.

Will you be purchasing taxable goods or services for use in Connecticut without paying Connecticut sales tax? ..... ☐ Yes ☐ No

If you answered **Yes** to the business use tax question, **enter the tax liability start date.** .....                                
m m d d y y

If you answered **No**, you must complete the *Business Use Tax Declaration* section below.

**Business Use Tax Declaration:** By registering for any of the taxes listed in this application, you have indicated to the Department of Revenue Services (DRS) that you may have a business use tax liability. Therefore, based on your application, you will be automatically registered for the business use tax unless you complete the following declaration.

I, \_\_\_\_\_ (name of taxpayer or authorized representative of taxpayer), acknowledge I have read and understand the information concerning the business use tax and declare I will not be liable for business use tax. Please initial here. \_\_\_\_\_

## 13. Registration Fee Schedule

Enter the registration fee amount indicated. If you are liable for either sales and use taxes or room occupancy tax, or both, as indicated in Sections 8 or 9, you must pay a \$100 registration fee. Enter the appropriate registration fee(s) from Addendum A if you are registering for the cigarette tax. You must include the total registration fee due with Form REG-1 or your registration application **will not be processed** and will be returned.

Make your check payable to: **Commissioner of Revenue Services**. If you register by mail, send Form REG-1 with your payment to: Department of Revenue Services, PO Box 2937, Hartford CT 06104-2937

### Registration Fee

a.	If registering for <b>sales and use taxes</b> or <b>room occupancy tax</b> , enter \$100.* .....	a.	
b.	If registering for <b>cigarette tax</b> , see Addendum A. ....	b.	
c.	<b>Total registration fee due:</b> Add Line a and Line b. ....	c.	

\* No fee is required for room occupancy tax if you are registered or are registering for sales and use taxes.

## 14. All Applicants Must Sign the Following Declaration

I declare under penalty of law that I have examined this application and, to the best of my knowledge and belief, it is true, complete, and correct. I understand the penalty for willfully delivering a false application to DRS is a fine of not more than \$5,000, or imprisonment for not more than five years, or both.

Sign here and keep a copy for your records.	Signature of owner, partner, LLC member, or corporate officer	Date	Telephone number
	Print name of owner, partner, LLC member, or corporate officer	Title	

**COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES  
CONTRACT COMPLIANCE REGULATIONS  
NOTIFICATION TO BIDDERS**

**AFFIRMATIVE ACTION COMPLIANCE AFFIDAVIT**

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in the daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

- (a) the bidder's success in implementing an affirmative action plan;
- (b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder's promise to develop and implement a successful affirmative action plan;
- (d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

**\*INSTRUCTIONS:** Bidder must sign acknowledgement below and return acknowledgement to Awarding Agency along with bid proposal.

The undersigned acknowledges receiving and reading a copy of the "Notification to Bidders" form.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

On behalf of:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONNECTICUT COMMISSION ON HUMAN RIGHTS & OPPORTUNITIES  
CONTRACT COMPLIANCE REGULATIONS AND NOTIFICATION TO BIDDERS  
Sections 46a-68j-23 (1)-(10) and 46a-68j-24 (a)

**CONTRACT COMPLIANCE**

**Sec. 46a-68j-23. Obligations of Contractors:**

Every contractor awarded a contract subject to contract compliance requirement shall:

- 1) Comply fully with all federal and state anti-discrimination laws, and shall not discriminate or permit a discriminatory practice to be committed;
- 2) Cooperate fully with the commission;
- 3) Submit periodic reports of its employment and subcontracting practices in such a form, in such a manner and at such a time as may be prescribed by the Commission;
- 4) Provide reasonable technical assistance and training to minority business enterprises to promote the participation of such concerns in state contracts and subcontracts;
- 5) Make a good faith effort, based upon the availability of minority business enterprises in the labor market area, to award a reasonable proportion of all subcontractors to such enterprises;
- 6) Maintain full and accurate support data for a period of two (2) years from the date the record is made or the date the contract compliance form is submitted, whichever is later, provided that this provision shall not excuse compliance with any other applicable record retention, state regulation or policy providing for a period of retention in excess of two (2) years;
- 7) Not discharge, discipline or otherwise discriminate against any person who has filed a complaint, testified or assisted in any proceeding with the commission;
- 8) Make available for inspection and copying any support data requested by the commission, and make available for interview any agent, servant or employee having knowledge of any matter concerning the investigation of a discriminatory practice complaint or any matter related to a contract compliance review;
- 9) Include a provision in all subcontracts with minority enterprises requiring that the minority business enterprise provide the Commission with such information on its structure and operations as the Commission finds necessary to make an informed determination as to whether the standards of Section 4a-60 of the Connecticut General Statutes as amended by Sec. 2 of Public Act 89-253 have been met; and
- 10) Undertake such other reasonable activities or efforts as the Commission may prescribe to ensure the participation of minority business enterprises as state contractors and subcontractors.

**Sec 46a-68j-24. Utilization of Minority Business Enterprises:**

- a) Contractors shall make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on all projects subject to contract compliance requirements.

**CONNECTICUT COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES  
WORKFORCE ANALYSIS**

Contractor Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

Total number of CT employees:  
Full-time \_\_\_\_\_ Part time \_\_\_\_\_

Complete the following Analysis for employees of Connecticut work sites who are:

JOB CATEGORIES	OVERALL TOTALS (SUM OF ALL COLS. MALE & FEMALE)	WHITE (NOT OF HISPANIC ORIGIN)		BLACK (NOT OF HISPANIC ORIGIN)		HISPANIC		ASIAN OR PACIFIC ISLANDER		AMERICAN INDIAN OR ALASKAN NATIVE		PEOPLE WITH DISABILITIES	
		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
OFFICIALS & MANAGERS													
PROFESSIONALS													
TECHNICIANS													
PARAPROFESSIONAL													
SALES WORKER													
OFFICE & CLERICAL													
CRAFT WORKERS (Skilled)													
OPERATIVES (Semi-skilled)													
LABORERS (unskilled)													
SERVICE WORKERS													
TOTALS ABOVE													
TOTALS ONE YEAR AGO													

**FORMAL, ON - THE JOB TRAINEES (Enter figures for the same categories as are shown above).**

Apprentices													
Trainees													

EMPLOYMENT FIGURES WERE OBTAINED FROM VISUAL CHECK: \_\_\_\_\_ EMPLOYMENT RECORDS: \_\_\_\_\_ OTHER: \_\_\_\_\_

1. Have you successfully implemented an Affirmative Action Plan? Yes: \_\_\_\_\_ Date of implementation \_\_\_\_\_  
Not Applicable: \_\_\_\_\_ Explain: \_\_\_\_\_

(a) Please submit a summary of your Affirmative Action Plan.

2. Have you successfully developed an apprenticeship program complying with Sec. 46a-68-17 of the Connecticut Department of Labor Regulations, inclusive? Yes: \_\_\_\_\_ No: \_\_\_\_\_ Not Applicable: \_\_\_\_\_ Explanation: \_\_\_\_\_
3. According to EEO-1 data, is the composition of your workforce at or near parity when compared with the race and gender composition of the workforce in the relevant labor market area? Yes: \_\_\_\_\_ No: \_\_\_\_\_ Explanation: \_\_\_\_\_
4. If you plan to subcontract, will you set aside a portion of the contract for legitimate minority business enterprises? Yes: \_\_\_\_\_ No: \_\_\_\_\_ Explanation: \_\_\_\_\_

\_\_\_\_\_  
Contractor's Authorized Signature

\_\_\_\_\_  
Date

## DEFINITIONS FOR WORKFORCE ANALYSIS

### RACE/ETHNIC IDENTIFICATION:

You may acquire the race/ethnic information necessary for this report either by visual surveys of the Workforce, or from records as to the identity of employees after the starting date of employment.

Please note that conducting a visual survey and keeping records of the race/ethnic identity of employees is legal in all jurisdictions and under all Federal and State Laws.

Race/ethnic designations as used by the Equal Employment Opportunity Commission do not denote scientific definitions of anthropological origins. For the purpose of this report, an employee may be included in the group to which he or she appears to belong, identifies with, or is regarded in the community as belonging. However, no person should be counted in more than one race/ethnic group.

### DESCRIPTION OF JOB CATEGORIES:

**Officials and managers:** Occupations requiring administrative managerial personnel who set broad policies, exercise overall responsibility for execution of these policies, and direct individual departments or special phases of a firm's operations. *Includes: officials, executives, middle management, plan managers, department managers, and superintendents, salaried supervisors who are members of management, purchasing agents and buyers, railroad conductors and yard masters, ship captains, mates and other officers, farm operators and managers, and kindred workers.*

**Professionals:** Occupations requiring either college graduation or experience of such kind and amount as to provide a comparable background. *Includes: accountants and auditors, airplane pilots, and navigators, architects, artists, chemists, designers, dietitians, editors, engineers, lawyers, librarians, mathematicians, natural scientists, registered professional nurses, personnel and labor relations specialists, physical scientists, physicians, social scientists, teachers, and kindred workers.*

**Technicians:** Occupations requiring a combination of basic scientific knowledge and manual skill which can be obtained through two (2) years of post-high school education, such as is offered in many technical institutes and junior colleges, or through equivalent on-the-job training. *Includes: computer programmers, drafters, engineering aides, junior engineers, mathematical aides, licensed practical or vocational nurses, photographers, radio operators, scientific assistants, surveyors, technical illustrators, technicians (medical, dental, electronic, physical science), and kindred workers.*

**Sales:** Occupations engaging wholly or primarily in direct selling. *Includes kindred workers.*

**Office and clerical:** All clerical type work regardless of level of difficulty. *Includes kindred workers.*

**Craft Workers:** (*skilled*) - Manual workers of relatively high skill level having a thorough comprehensive knowledge of the processes involved in their work. Exercise considerable independent judgment and usually receive an extensive period of training. Includes *kindred workers*.

**Operatives:** (*semiskilled*) - Workers who operate machine or processing equipment or perform other factory-type duties of intermediate skill level which can be mastered in a few weeks and require only limited training. Includes *kindred workers*.

**Laborers:** (*unskilled*) - Workers in manual occupations which generally require no special training, perform elementary duties that may be learned in a few days and require the application of little or no independent judgment. Includes *kindred workers*.

**On-the job trainees:**

**Production:** Persons engaged in formal training as a craft worker - when not trained under apprentice programs - operative, laborer and service occupations.

**White collar:** Persons engaged in formal training for clerical, managerial, professional, technical, sales office and clerical occupations.

### UTILIZATION FORM

This form developed pursuant to Section 46a-68j-23(5) of Regulations of Connecticut state Agencies concerning Contract Compliance.

# AFFIDAVIT

I, \_\_\_\_\_ acting on behalf of  
(Name of person signing certification)

\_\_\_\_\_ of which I am the  
(Contractor)

\_\_\_\_\_ Certify and affirm:  
(Title)

*Check if provision applicable:* \_\_\_\_ That the following minority business subcontractors and /or suppliers of materials that \_\_\_\_\_ has hired for Contract No. \_\_\_\_\_ with  
(Contractor)  
\_\_\_\_\_ meet the criteria for Minority Business Enterprises set out in  
(Awarding Agency)  
Section 4a-60 of the Connecticut General Statutes: \_\_\_\_\_  
(Lists names of Minority Business Enterprises that qualified under current  
statutory requirements)

*Check if provision applicable:* \_\_\_\_ That the \_\_\_\_\_ has hired the following  
(Contractor)  
minority business subcontractors or suppliers of materials for Contract No. \_\_\_\_\_ with  
\_\_\_\_\_ that are not registered with the Department of  
(Awarding Agency)  
Economic Development, but which should be considered by the Connecticut Commission on Human Rights and  
Opportunities when evaluating \_\_\_\_\_ the good faith efforts:  
(Contractor)  
(List names of unregistered MBEs)

I further certify and affirm that I have read and understand the contract compliance requirements codified at Section 4a-60 and Section 46a-7 1 (d) of the Connecticut General statutes.

I further certify and affirm that I have read and understand the contract compliance Regulations codified at Section 46a-68j-2 I through 43 of the Regulations of Connecticut State Agencies.

I understand that false statements made herein are punishable by law.

\_\_\_\_\_  
(Name of Corporation or Firm)

\_\_\_\_\_  
(Signature and Title of Official Making the Affidavit)

Subscribed and sworn to before me, this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_.

\_\_\_\_\_  
Notary Public/Commissioner of the Superior Court

My Commission Expires \_\_\_\_\_

CERTIFICATE OF CORPORATION

I, \_\_\_\_\_ certify that I am the Secretary of the Corporation named in the foregoing instrument; that I have been duly authorized to affix the seal of the Corporation to such papers as require the seal; that \_\_\_\_\_ who signed said instrument on behalf of the Corporation was then \_\_\_\_\_ of said Corporation; that said instrument was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its Corporation powers.

\_\_\_\_\_  
(Signature of person Certifying)

(Corporate Seal)

SAMPLE: (You may use this as an example or you may use it as your statement by placing it on your letterhead).

## AFFIRMATIVE ACTION POLICY STATEMENT

It has always been the policy and will continue to be the strong commitment of \_\_\_\_\_ and all contractors and subcontractors who do business with \_\_\_\_\_ to provide equal opportunities in employment to all qualified persons solely on the basis of job-related skills, ability and merit.

\_\_\_\_\_ will continue to take affirmative action to ensure that no persons are discriminated against with regard to their race, color, sex, sexual orientation, national origin, ancestry, religion, age, physical disability, mental retardation, marital status, present or past history of mental disorder, learning disability or criminal record. Such action includes, but is not limited to, 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. \_\_\_\_\_ will continue to make good faith efforts to comply with all federal and state laws and policies which speak to Equal Employment Opportunity and Affirmative Action.

Equal Employment Opportunity is essential, but is not enough to guarantee the full and fair employment of minorities, women or other protected classes. Therefore, Affirmative Action is necessary. Affirmative Action is results - oriented programs used to address and overcome the present effects of past discrimination.

Sexual Harassment, another form of sex discrimination, will not be tolerated in the work place. Therefore, engaging in acts of sexual harassment or any other forms of unlawful discrimination will constitute grounds for disciplinary action.

This Policy Statement is based on both the spirit and the letter of state and federal anti discrimination laws, regulations and executive orders. Accordingly, care is taken to ensure that no person shall be excluded from participation in, be denied the benefits of, or otherwise be unlawfully discriminated against. Further,

\_\_\_\_\_ will not knowingly use the services of, patronize or otherwise deal with any business, contractor, subcontractor or agency that engages in acts of unlawful discrimination.

This Affirmative Action Policy Statement reaffirms my personal commitment to the principles of Equal Employment Opportunity and Affirmative Action.

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATED

**SECTION 00 7300**  
**SUPPLEMENTARY CONDITIONS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. These Supplementary Conditions amend and supplement the Agreement and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the Agreement Information for Bidders, have the meanings assigned to them in the Agreement.

**1.2 RELATED SECTIONS**

- A. Section 01 1000 - Summary of Contract for additional definitions.

**1.3 MODIFICATIONS TO INFORMATION TO BIDDERS PART 2**

- A. Insurance Procedure - Insurance Requirements, Par G: Certificate Holder: Add the following: "Fuller and D'Angelo, P.C. Architects and Planners and their Consultants. Add to all applicable insurance policies"

**1.4 MODIFICATIONS TO THE AGREEMENT**

- A. Article 1 Definitions
  - 1. Add "Supplements to Bid Form" to list of documents which constitute the "Contract"
- B. Article 20 Permits
  - 1. Delete and substitute the following:  
"Permits: The Owner will obtain and pay for all permits required for this project. Contractor shall provide all insurance certificates to local officials, as required, to activate the permits."
- C. Article 27 Moneys May Be Retained
  - 1. Add the following: Refer to Section 01 2000 - Price and Payment Procedures for retainage and other additional requirements."
- D. Article 27
  - 1. Extra Work, Add at the end of the Paragraph, "that no Extra Work, in the form of Change Order Work to the project is to take place without formal written consent from the Owner. The Contractor at the Owners request is to expeditiously obtain pricing both labor and materials and OH+P for the full total amount of additional work and present same to the Owner and Construction Manager for review and approvals of the work prior to executing the work except in the case of emergency as decided by the Contractor, Owner and Construction Management Team. All standard Extra Work performed shall started only after written approval of the formal Change Order by the Owner. Extra Work performed by the Contractor prior to written consent is subject to not being fully and or partially reimbursed to the Contractor if approvals are not acquired prior to performing the work."
- E. Add New Article
  - 1. "Article 37 Sub-contractor/Vendor Town Review and Approval: The Contractor Prior to awarding a subcontractor or making purchases from a vendor who will be performing the work requires to have their credentials produced for the Town's review.
- F. Add New Article 38
  - "Abandonment of Work or other Default: If the work shall be abandoned, or any part thereof shall be sublet without previous written consent of the Town/Board of Education, or the contract or any monies payable hereunder shall be assigned otherwise than as herein specified, or if at any time the Superintendent or designee shall be of the opinion and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the work or

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MILBANK SCHOOL  
LIFE SKILLS CLASSROOM & RELATED ITEMS  
SUPPLEMENTARY CONDITIONS

any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the contract, or if the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the bankruptcy act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the contract, the Town/Board of Education may designate, and the Town/Board of Education may, upon giving such notice, by contract or otherwise as it may determine, complete the work of such part thereof and charge the entire cost and expense of so completing the work, the Town/Board of Education shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay to the Town/Board of Education any losses, damages, costs and expenses, including attorney's fees, sustained or incurred by the Town/Board of Education by reason of any of the foregoing causes. For the purpose of such completion, the Town/Board of Education may for itself or for any Contractors employed by the Town/Board of Education, take possession of and use or cause to be used, any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the work.

All costs, expenses, losses, damages, attorney's fees, and any and all other charges incurred by the Town/Board of Education under this deducted and/or paid by the Town/Board of Education out of any monies due or article shall be charged against the Contractor and deducted and/or paid by the Town/Board of Education out of any monies due to payable or to become due or payable under the Contract to the Contractor. In computing the amounts chargeable to the Contractor, the Town/Board of Education shall not be held to a basis of the lowest prices for which the completion of the work or any part thereof might have been accomplished, but all sums actually paid or obligated therefore to effect is prompt completion shall be charged to and against the account of the Contractor. In case the costs, expenses, losses, damages, attorneys' fees and other charges together with all payments therefore made to and for the account of the Contractor are less than the sum which would have been payable under the contract if the work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference, and in case such costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments, theretofore made to or for the account of the Contractor shall exceed the said sum, the Contractor shall pay the amount of the excess to the Town/Board of Education.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

FULLER AND D'ANGELO, PC  
ARCHITECTS AND PLANNERS

**SECTION 01 1000  
SUMMARY OF CONTRACT**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 PROJECT**

- A. Owner's Name: Greenwich Public Schools  
290 Greenwich Avenue  
Greenwich CT 06830
- B. Architect's Name: Fuller and D'Angelo, P.C.  
45 Knollwood Road  
Elmsford, NY 10523

**1.3 PROJECT DESCRIPTION**

- A. The Project consists of the alteration of Life Skill Classroom and Related Work, Milbank School, 200 East Elm St, Greenwich CT 06930.

**1.4 DEFINITIONS**

- A. General: Refer to Agreement for additional Basic Contract definitions.
- B. Owner: The term "Owner shall mean Greenwich Public Schools and their duly authorized representative.
- C. The word "Owner" and the words "School Board", "City School District", "Board of Education", "Union Free School District", "Central School District", "Town/School Board" etc., shall have the same meaning.
- D. Architect: The term "Architect" or "Engineer" or the words "Architect/Engineer" shall mean the Professional Engineer/Architect responsible for the contract documents Fuller & D'Angelo, P.C. Architects & Planners 45 Knollwood Road, Elmsford, N.Y. 10523.
- E. Owner's Representative: The term Owner's Representative shall mean Dan Watson, Director of Facilities.
- F. Contractor for Construction: The term "Contractor for Construction", "General Contractor", "Mechanical Contractor", "Contractor for General Work", "Construction Contractor", "Plumbing Contractor", "Electrical Contractor", and "Roofing Contractor" shall have the same meaning.
- G. "Approved": The term "approved," when used in conjunction with Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Section 01 3000 - Administrative Requirements.
- H. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed or requested by Contracting Officer or Agency, and similar phrases.
- I. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- J. "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.
- K. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

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SUMMARY OF CONTRACT

- L. "Install": The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- M. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- N. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.
- O. 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.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.
- P. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.
- Q. The term "Building Code" shall mean the Building Code of the State of Connecticut including all amendments and reference standards to date.
- R. "Work" - Labor, materials, equipment, apparatus, controls, accessories, and all other items customarily furnished and/or required for proper and complete disconnection and reconnection, installation of new work.
- S. "Wiring" - Conduit, fittings, wire, junction and outlet boxes, switches, cutouts, and receptacles and all items necessary or required in connection with or relating to such wiring.
- T. "Concealed" - Embedded in masonry or other construction, installed behind wall furring, within double partitions, or hung ceilings, in trenches, or in crawl spaces.
- U. "Exposed" - Not installed underground or "Concealed" as defined above.

#### **1.5 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Price as described in the Form of Agreement .
- B. Local custom and trade-union jurisdictional settlements do not control the scope of Work included in each prime contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, the affected prime contracts shall promptly negotiate a reasonable settlement to avoid or minimize the pending interruption and delays.

#### **1.6 SUBCONTRACTORS/SUPPLIERS**

- A. Submittal of Primary Sub Contractors and Suppliers include but not limited to the following:
- B. General Contractor:
  - 1. Removals
  - 2. Interior Trench Excavation
  - 3. Concrete slab / cut/ patch
  - 4. Limited Concrete Work
  - 5. Laminated Clad Casework
  - 6. Door and Frame relocate
  - 7. Gypsum Wallboard Assemblies
  - 8. Cutting and Patching

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- 9. Painting
- 10. Plumbing Sub-Contractor
  - a. Plumbing Work and Fixture Supplier.
  - b. Plumbing equipment/Suppliers.
- 11. Mechanical Sub-Contractor
  - a. HVAC Units
  - b. Ductwork
- C. Electrical Sub-Contractor
  - 1. Electrical Work and Supplier
  - 2. Panelboards.

**1.7 DESCRIPTION OF ALTERATIONS WORK**

- A. Scope of selective removal work is shown on drawings and is specified .
- B. Scope of Work - General - Life Skill Classroom Fit -out with Kitchen, Appliances and Related Work
- C. Renovate the following rooms and spaces, complete including operational mechanical and electrical work and finishes:
  - 1. Life Skills Classroom.
- D. Electrical: ALTERNATES. - See Alternates Section.

**1.8 Greenwich Public Schools will remove the following items before start of work:**

- A. Existing FFE in the space.

**1.9 WORK SCHEDULE**

- A. Project is designed for Removals and Installations are scheduled for Summer 2023 School Recess. No work shall be performed when School is fully occupied.
- B. Provide 2 days for the Owners reinstallation of furnishings.

**1.10 OWNER OCCUPANCY**

- A. Greenwich Public Schools intends to occupy the Project upon Substantial Completion. The construction completion date is August 24, 2023. - Close-out documents due by September 15, 2023 See other Milestone dates below.
- B. Cooperate with Greenwich Public Schools to minimize conflict and to facilitate Greenwich Public Schools's operations. Coordinate any shut downs with the District Five (5) days in advance, no shut downs will be permitted without prior authorization.
- C. Schedule the Work to accommodate Owner's occupancy.

**1.11 CONTRACTOR USE OF SITE AND PREMISES**

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
  - 1. Greenwich Public Schools occupancy.
  - 2. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by Greenwich Public Schools:
  - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  - 2. Do not obstruct roadways, sidewalks, or other public ways without Owner permission and coordination.
- D. Time Restrictions:
  - 1. Limit conduct of especially noisy exterior work to when the building is unoccupied.

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2. Contractors shall comply with Local Noise Ordinance. Work disrupting the community must be performed with the following hours:
  - a. Monday thru Friday: 8 AM to 5 PM.
  - b. Saturdays: 9 AM to 4 PM with permissions
  - c. Sundays: No Work on the Exterior allowed
- E. Construction deliveries shall not occur during the hours of 7:30 AM and 9:00 AM and 2:00 PM and 3:00 PM, when school buses are arriving or leaving the school grounds, or for Summer events.
- F. Only materials and equipment, which are to be used directly in the work, shall be brought to and stored on the project site by the Contractor. After equipment is no longer required for the work, it shall be promptly removed from the project site. Protection of construction materials and equipment stored at the project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractors.
- G. Contractor shall ensure that the work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the work and all adjacent areas. The work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the work shall be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, the contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of:
  1. Any areas and buildings adjacent to the site of the work or;
  2. The Building in the event of partial occupancy as more..
- H. Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitations, lavatories, toilets, entrances and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with the rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project Site, and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance requirements, applicable to use, and occupancy of the Project Site and the Building.
- I. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- J. Lock automotive type vehicles such as passenger cars and trucks and other types of mechanized and motorized construction equipment, when parked and unattended, to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
- K. Keep public areas such as hallways, stairs, elevator lobbies and toilet rooms free from accumulation of waste material, rubbish or construction debris.
- L. Smoking, drinking of alcoholic beverages or open fires will not be permitted on the project site.

**1.12 AVAILABILITY OF EXISTING SITE**

- A. The existing building and site work areas for Base Bid and Alternate Work will be available to the Contractors as follows:
  1. June 26, 2023 through August 24, 2023: Dawn to Dusk subject to Local Noise ordinance.
  2. **While school is not in session** school holidays, summer school recess and weekends work hours Monday through Friday are:
    - a. 7:00 AM thru 8:00 PM
  3. School holidays, weekends work hours are: Saturday
    - a. 9:00 AM thru 6:00 PM

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4. The School shall be accessible for shop drawing field measurements following School protocols and only between 4pm and 8pm weekdays, or as arranged with District personnel.
- B. Upon request by the Contractor, the building may be made available, at the discretion of the Owner in addition to the above listed hours, before the formal contract date. A request for use during these off-regular hours must be made at least two (2) days before the use. Such off-hours may include Saturdays, and Holidays.
- C. If the Contractor requests the use of the facility for off-hours to maintain the scheduled completion date, the Contractor shall pay all additional costs in connection with opening, providing security and project management expenses incurred with no costs to the Owner. All expenses shall be deducted from the Contractors contract price. Comply with other portions of this Section.
  1. Weekend, Holiday and Night Work:
    - a. The contractor shall make no claim for delay for the inability of the Owner to make the site available for off-hours work. Should the Owner make the site available during these hours at the contractor's request, the cost will be borne by the Contractor.
- D. **THE CONTRACTOR SHALL BE REQUIRED TO PERFORM SCHEDULED WORK WITHIN THE EXISTING BUILDING ONLY DURING THE TIME PERIODS INDICATED AND SHALL INCLUDE IN THE BID ALL COSTS FOR LABOR, MATERIAL, ETC. INCLUDING PREMIUM TIME TO PERFORM THE WORK, PER THE TIME PERIOD.**

**1.13 WORK SEQUENCE**

- A. Start of Work - Letter of Award of Contract.
- B. **MILESTONE SCHEDULE - Start of Construction:**
  1. **PHASE 1 - ADMINISTRATIVE**
    - a. Start Date: Letter of Award
      - a) Tasks: Schedule of Values, Progress Schedule, Contracts, Bonds and Insurance, Field verification of existing conditions, and submittals,
    - b. Completion Date: March 29, 2023
  2. **PHASE 2 - Procurement of MATERIALS:**
    - a. Start Date: Letter of Award.
      - a) Tasks: Procurement of Long Lead Materials for Construction, Cabinets and Appliances.
    - b. Completion Date: June 20 , 2023
  3. **PHASE 3 - Project CONSTRUCTION START AND FINISH**
    - a. START DATE: June 26, 2023
    - b. TASKS: Remove and Replace Base Bid Work Scope and Related Work and Selected Alternate Roof Areas and Related Work
    - c. Punchlist ready by August 23, 2023
    - d. CONSTRUCTION COMPLETION DATE: August 24, 2023
- C. Project Completion Date: September 15, 2023
- D. Coordinate construction schedule and operations with Owner and Construction Manager.

**1.14 CONTRACT NO. 1 - GENERAL CONSTRUCTION**

- A. The work of the Contract includes but not limited to the following: Base Bid, Alternates, and Allowances
  1. All front end documentation, schedules, submittals, field measurements and preparation of shop drawings, followed by ordering of piping and equipment.
  2. Removals.
  3. Concrete slab cutting and repairs
  4. Doors and Frames adjustments
  5. Plumbing fixtures.

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6. Mechanical Equipment
7. Firestopping.
8. Sealants
9. Rough Carpentry
10. Painting
11. Cutting and Patching.
12. Temporary Protection of openings and work areas .
13. Providing HVAC work
14. Provide punchlist.
15. Interior finishes.
16. Provision of close out documents, including but not limited to as-builts, operations manuals and warranty /guarantees.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 2000**  
**PRICE AND PAYMENT PROCEDURES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Change procedures.
- C. Procedures for preparation and submittal of application for final payment.

**1.3 RELATED REQUIREMENTS**

- A. Owner's Agreement and Front End documents.

**1.4 SCHEDULE OF VALUES**

- A. Form to be used: AIA G702/ AIA G703.
- B. Forms filled out by hand will not be accepted.
- C. Submit Schedule of Values in duplicate within 10 days after date Notice of Award.
- D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section.
- E. Revise schedule to list approved Change Orders, with each Application For Payment.
- F. Provide a separate line item for the following: (where applicable)
  - 1. Labor and materials, when payment is anticipated for material not yet installed
  - 2. Each Allowance.
  - 3. Bonds, if required.
  - 4. Each alternates
  - 5. As-built Drawings.
  - 6. Testing.
  - 7. Punch List
  - 8. Final Cleaning
  - 9. Closeout Documents
  - 10. Identify line items being performed by subcontractors.

**1.5 APPLICATIONS FOR PROGRESS PAYMENTS**

- A. Payment Period: Submit no more that one (1) payment per month until scheduled completion date.
- B. Forms filled out by hand will not be accepted.
- C. For each item, provide a column for listing each of the following:
  - 1. Item Number.
  - 2. Description of work.
  - 3. Scheduled Value.
  - 4. Previous Applications.
  - 5. Work in Place and Stored Materials under this Application.
  - 6. Total Completed and Stored to Date of Application.
  - 7. Percentage of Completion.
  - 8. Balance to Finish.
  - 9. Retainage.

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- D. Execute certification by signature of authorized officer.
- E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- G. Submit three copies of each Application for Payment. (Electronic Processing may be acceptable)
- H. Include the following with the application:
  - 1. Transmittal letter as specified for Submittals in Section 01 3000.
  - 2. Construction progress schedule, revised and current as specified in Section 01 3000.
  - 3. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from contractor, subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
  - 4. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 5. Submit Final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  - 6. Waiver Forms: Submit waivers of lien on forms, acceptable to Owner.
  - 7. Certified Payrolls; All Applications for Payment must be accompanied with certified payrolls for all Contract Work performed. In addition each contractor and sub-contractor shall submit to the Owner each application, a transcript of the original payroll record subscribed and affirmed as true under penalties of perjury. The Owners shall be required to receive and maintain such payroll records. The original payrolls or transcripts shall be preserved for three years from the completion of the work on the awarded project.
    - a. Submit certification that all personnel listed on certified payrolls have successfully completed an OSHA construction safety and health course of at least 10 hours prior to performing any work on the project.
- I. Project record documents as specified in Section 01 7800, shall be available for review by Greenwich Public Schools as a prerequisite for approval of payment.
- J. Bill of Laiden with Affidavits attesting to off-site stored products with proof of full insurance coverage listing Greenwich Public Schools as payee.
- K. The Owner shall retain Five (5) percent of the amount of each payment.

**1.6 INITIAL APPLICATION FOR PAYMENT:**

- A. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. Names of full time project manager, on site superintendent, and foreman. Refer to the Agreement for addition requirements.
  - 2. List of subcontractors, suppliers and fabricators: Refer to Section 01 100 Summary of Contract(s) .
  - 3. Schedule of Values.
  - 4. Contractor's Construction Schedule (preliminary if not final).
  - 5. Products list.

**1.7 APPLICATION FOR PAYMENT AT SUBSTANTIAL COMPLETION**

- A. Refer to the Agreement and with Requirements of Section 01 7800 - Closeout Submittals.

**1.8 MODIFICATION PROCEDURES**

- A. Refer to the Agreement for requirements.
- B. The Contractor shall be responsible for informing others in it's employ, subcontractor's whose work is affected by any modifications.

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- C. Computation of Change in Contract Amount:
  - 1. Refer to the Agreement.
- D. Execution of Change Orders: The Owner will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- E. Change Orders need to be broken down to include Labor, Materials, Rentals, a 10% Mark-up for Overhead and Profit by the contractor are the Maximum amount that will be considered.
- F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- H. Promptly enter changes in Project Record Documents.

**1.9 APPLICATION FOR PAYMENT AFTER SCHEDULED COMPLETION DATE**

- A. In the event the work is not completed by the schedule date, listed in Section 01 1000 - Summary of Contract, and in addition to the other remedies described, the Architect will not review progress payment requisitions submitted after the construction completion date, and the District will not issue any progress payments after that date, until all work is completed.
  - 1. Only one requisition for work performed after the construction completion date may be submitted, and it may be submitted only when all work is complete and a Punch List inspection is conducted; said requisition may be submitted when the work at 100% complete, less 5% retainage.

**1.10 APPLICATION FOR FINAL PAYMENT**

- A. Submit Affidavit for Final Payment included in the Project Manual.
- B. Comply with Section 01 7800 - Closeout Submittals
- C. It is understood by the Contractor that the maximum payment due the contractor prior to final payment shall be Ninety (95%) of the Contract amount and the final Five (5%) will be due only after the completion and submittal of all requirements of Section 01 7800 - Closeout Submittals are met, including completion of all "punch list" items.

**END OF SECTION**

**SECTION 01 2100  
ALLOWANCES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Cash allowances.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

**1.4 CASH ALLOWANCES**

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Cash Allowance.
- B. Fuller and D'Angelo, P.C. Responsibilities:
1. Consult with Architect, for consideration and selection of products, suppliers, and installers.
  2. Select products in consultation with Greenwich Public Schools and transmit decision to Contractor.
  3. Prepare Change Order.
- C. Contractor Responsibilities:
1. Assist Fuller and D'Angelo, P.C. in selection of products, suppliers, and installers.
  2. Obtain proposals from suppliers and installers and offer recommendations.
  3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
  4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
  5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- D. Differences in costs will be adjusted by Change Order.

**1.5 ALLOWANCES SCHEDULE**

- A. CONTRACT - GENERAL CONTRACTOR

1. CASH ALLOWANCE

- a. Cash Allowance **GC-1**: Include an allowance of Twenty Thousand 00/100 (\$20,000.00) DOLLARS for use according to the Owner's instructions.

**TOTAL ALLOWANCES GENERAL CONSTRUCTION**

Twenty Thousand \_\_\_\_\_ ( \$20,000.00)

DOLLARS

(Sum of 1.6.A..1 to be inserted on bid form). Section 01 2100 - Allowances to be submitted with bid and shown on bid form.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 2300  
ALTERNATES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Description of alternates for selection by the Owner, not included in the Base Bid.

**1.3 RELATED REQUIREMENTS**

- A. Document 00 2113 - INSTRUCTIONS TO BIDDERS: Instructions for preparation of pricing for Alternates.
- B. Section 00 4100 Bid Form for listing amount of each alternate.
- C. Document 00 5200 - Form of Agreement: Incorporating monetary value of accepted Alternates.

**1.4 ACCEPTANCE OF ALTERNATES**

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Greenwich Public Schools's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

**1.5 SCHEDULE OF ALTERNATES GENERAL CONSTRUCTION**

- A. Alternate No. 1 - Replace/relocate Boiler Room Panel:
  - 1. The Contractor for the above work shall state the combined amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Replace/relocate Boiler Room Panel in accordance with Contract documents.
- B. Alternate No. 2 - Replace Utility Pole on Property:
  - 1. The Contractor for the above work shall state the combined amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Replace Utility Pole on Property in accordance with Contract Documents.
- C. Alternate No. 3 - Furnish and Install new instantaneous HWH and associated power, vent and piping.:
  - 1. The Contractor for the above work shall state the amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to Furnish and Install new instantaneous HWH power, vent and piping. in accordance with the Contract Documents
- D. FOR VARUIOUS ALTERNATES SEE SHEET A-110 and related Construction Documents

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 3000**  
**ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Preconstruction meeting.
- B. Progress meetings.
- C. Construction progress schedule.
- D. Submittals for review, information, and project closeout.
- E. Number of copies of submittals.
- F. Submittal procedures.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary of Contract: Work covered by .
- B. Section 01 3553 - Site Safety and Security Procedures
- C. Section 01 7000 - Execution: Additional coordination requirements.
- D. Section 01 7800 - Closeout Submittals: Project record documents.

**1.4 PROJECT COORDINATION**

- A. Project Coordinator: Dan Watson, Director of Facilities .
- B. During construction, coordinate use of site and facilities through the Project Coordinator.
- C. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- D. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- E. Make the following types of submittals to Owner's Representative.
  - 1. Requests for interpretation.
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Test and inspection reports.
  - 5. Design data.
  - 6. Manufacturer's instructions and field reports.
  - 7. Applications for payment and change order requests.
  - 8. Progress schedules.
  - 9. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 10. Closeout submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.1 PRECONSTRUCTION MEETING**

- A. Project Coordinator will schedule a meeting after Notice of Award.
- B. Attendance Required:
  - 1. Greenwich Public Schools.

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2. Fuller and D'Angelo, P.C..
  3. Contractor and Major Sub- Contractors.
- C. Agenda:
1. Letter of Award
  2. Execution of Greenwich Public Schools-Contractor Agreement.
  3. Submission of executed bonds and insurance certificates within 7 days after LOI.
  4. Distribution of Contract Documents.
  5. Submission of list of Subcontractors, schedule of values, and progress schedule within 7 days.
  6. Designation of personnel representing parties to Contract and Architect.
  7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  8. Scheduling of the project.
  9. Use of premises by Greenwich Public Schools and Contractor(s) .
  10. Greenwich Public Schools's requirements and occupancy prior to completion.
  11. Construction facilities and controls provided by Greenwich Public Schools.
  12. Temporary utilities provided by Greenwich Public Schools.
  13. Survey existing facilities prior to starting construction.
  14. Security and housekeeping procedures.
  15. Procedures for testing.
- D. Architect will record minutes and distribute copies within five days after meeting to all participants. Objections to the Minutes should be submitted in writing within three business days otherwise they will be considered substantially correct. Contactor shall distribute to all entities of the Contractor affected by decisions made.

### 3.2 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum at two week intervals.
- B. Attendance Required:
1. Contractor.
  2. Greenwich Public Schools.
  3. Fuller and D'Angelo, P.C..
  4. Watsky Associates
  5. Contractor's Superintendent.
  6. Major Subcontractors.
- C. Agenda:
1. Review minutes of previous meetings.
  2. Review of Work progress.
  3. Field observations, problems, and decisions.
  4. Identification of problems that impede, or will impede, planned progress.
  5. Review of submittals schedule and status of submittals.
  6. Review construction safety programs.
  7. Review exiting and and separation of construction
  8. Maintenance of progress schedule.
  9. Corrective measures to regain projected schedules.
  10. Planned progress during succeeding work period.
  11. Coordination of projected progress.
  12. Maintenance of quality and work standards.
  13. Effect of proposed changes on progress schedule and coordination.

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14. Review change Orders, RFI's and Clarification Sketches.
  15. Other business relating to Work.
- D. Owner's Representative or Architect will record minutes and distribute copies within five days after meeting to all participants. Objections to the Minutes should be submitted in writing within three business days otherwise they will be considered substantially correct. Contactor shall distribute to all entities of the Contractor affected by decisions made.

### **3.3 COORDINATION MEETINGS**

- A. The Contractor shall schedule and hold weekly general project coordination meetings with the Owner's Representative, to review the work schedule for the week in order to insure the planned work does not conflict with facility operations.
1. One week before the scheduled week, a detailed meeting shall be held to review various detailed aspects of the project.

### **3.4 CONSTRUCTION PROGRESS SCHEDULE**

- A. Responsibility
1. The General Construction shall be responsible for preparing and updating the contract progress schedule.
  2. Within 10 days after date of the Notice of Award, the Contractor shall submit preliminary schedule .
  3. If preliminary schedule requires revision after review, submit revised schedule within 5 days.
  4. Within 3 days after joint review, submit complete schedule.
  5. Submit updated schedule with each Application for Payment.

### **3.5 SUBMITTALS FOR REVIEW**

- A. All submittals are the product and the property of the Contractor. The Owner or Architect shall not be responsible for the contractor's construction means, methods or techniques: safety precautions or programs; Acts or admissions; or failure to carry out the work in accordance to the contract documents. Submittals shall be made in one full submission, with all items together. Partial submittals shall be returned, un - reviewed.
- B. Shop Drawing Submittals shall be submitted no later than twenty (20) days after Letter of Award of Contract. No further payments will be made to the contractor until all of the following submittals are made:
- C. When the following are specified in individual sections, including but not limited to the following, submit them for review:
1. Schedule of Values
  2. Project Schedule
  3. Shop Drawings and Data Sheets.
  4. Samples for verification.
  5. ALL SUBMITTALS FOR MATERIALS SHALL BE FOR FULL INFORMATION ONLY, NO PARTIAL SUBMITTALS SHALL BE ACCEPTED
- D. Submit to Fuller and D'Angelo, P.C. for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
1. Submittals for HVAC, plumbing, or electrical submit directly to consultant with copy of transmittal to Architect and Owner's Representative
- E. Samples will be reviewed only for aesthetic, color, or finish selection.
- F. The Architect shall review and approve or take other appropriate action on the Contractor submittals, such as shop drawings, product data, samples and other data, which the Contractor is required to submit, but only for the limited purpose of checking for conformance with the design concept and the information shown in the Construction Documents. This review shall not include review of the accuracy or

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completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. The Architect's review shall be conducted with reasonable promptness while allowing sufficient time in the Architect's judgment to permit adequate review. Review of a specific item shall not indicate that the Architect has reviewed the entire assembly of which the item is a component. The Architect shall not be responsible for any deviations from the Construction Documents not brought to the attention of the Architect, in writing, by the Contractor. The Architect shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

- G. Marking or comments on shop drawings shall not be construed as relieving the Contractor from compliance with the contract project plans and specifications, nor departure therefrom. The contractor remains responsible for details and accuracy for conforming and correlating all quantities, verifying all dimensions, for selecting fabrication processes, for techniques of assembly and for performing their work satisfactorily and in a safe manner.
- H. Initial Review: Allow 5 working days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
- I. **Architect will review the original submittal and one (1) re submittal. Additional reviews will be additional services provided to the Owner and charged accordingly. The Owner will back charge the contractor accordingly.**
- J. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- K. **Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.**

### 3.6 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
  - 1. Design data.
  - 2. Certificates.
  - 3. Test reports.
  - 4. Inspection reports.
  - 5. Manufacturer's instructions.
  - 6. Manufacturer's field reports.
  - 7. Other types indicated.
- B. Submit for Fuller and D'Angelo, P.C.'s knowledge as contract administrator or for Greenwich Public Schools. No action will be taken.

### 3.7 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Refer to Section 01 7800 for requirements.

### 3.8 NUMBER OF COPIES OF SUBMITTALS

- A. All submittals shall be in electronic PDF format and conforming to the following:
  - 1. Each item shall be in a separate file.
  - 2. Each file name shall start with the specification section number and contain an abbreviated explanation of what it contains; for example:
    - a. 09 9000 Painting.
  - 3. Add Revision number (Rev2 Rev3, etc) to the file name when resubmitting items, for example:
    - a. 09 9000 Painting Rev 1.
  - 4. Use capital letters and spaces to make the names "readable" do not use special characters, underscores, hyphens, etc.

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5. Keep the file names short, no more than 25 characters.
  6. Provide a transmittal with each electronic submittal and list each item that's included.
  7. Provide a Cover Sheet with each item - in the same file as the technical submittal.
  8. Do not add dates to the file names, the files are automatically dated when created..
  9. Do not zip the files, and do not put the files in Folders.
  10. Do not email electronic submittal attachments larger than 5 MB.
  11. Do not email multiple electronic submittals- rather bundle the submittals on a CD or USB Drive and send the CD/USB via FedEx or other overnight mail.
  12. Make all technical submittals at one time - refer to the specification for additional submittal requirements for example:
    - a. Concrete; Masonry; Miscellaneous Fabrications; Roofing; etc.
  13. Do not send MSDS with the technical submittals; collate all of the MSDS needed for the entire project in three ring binders, organized by specification section, and submit the binders to the Owner's Representative and maintain one copy at the project site.
- B. Documents for Information: Submit two copies.
- C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Fuller and D'Angelo, P.C..
1. After review, produce duplicates.
  2. Approved sample will be retained at the project site.
  3. Retained samples will not be returned to Contractor unless specifically so stated.
  4. Submit with each sample, in electronic PDF, data, cuts, photos, color, charts, etc.

### 3.9 SUBMITTAL PROCEDURES

- A. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
  2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
- B. Transmit each submittal with a copy of approved submittal form.
- C. Transmit each submittal with transmittal.
- D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
1. Contractor's submittal of shop drawings certifies that the contractor has reviewed and coordinated this shop drawing and they are in conformance to the plans, specifications, applicable codes and other provisions of the Contract Documents.
- G. Deliver submittals to Architect at business address.
- H. Schedule submittals to expedite the Project, and coordinate submission of related items.
- I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- J. Provide space for and Fuller and D'Angelo, P.C. and consultants review stamps.
- K. When revised for resubmission, identify all changes made since previous submission.

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- L. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- M. Submittals not requested will not be recognized or processed.

**3.10 ARCHITECT'S ACTION**

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. General: Except for submittals for the record and similar purposes, where action and return on submittals is required or requested, the Architect/Engineer will review each submittal, mark with appropriate "Action".
- C. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
  - D. Final Unrestricted Release: Where the submittals are marked as follows, the work covered by the submittal may proceed provided it complies with the requirements of the contract documents; acceptance of the work will depend upon that compliance.
    - 1. Marking: "No Exceptions Taken"
  - E. Final-But-Restricted Release: When the submittals are marked as follows, the work covered by the submittal may proceed provided it complies with both the Architect's/Engineer's notations or corrections on the submittal and with the requirements of the contract documents; acceptance of the work will depend on that compliance.
    - 1. Markings: "Make Correction Noted"
  - F. Returned for Re-submittal: When the submittal is marked as follows, do not proceed with the work covered by the submittal, including purchasing fabrication, delivery or other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's/Engineer's notations stating the reasons for returning the submittal; resubmit the submittal without delay. Repeat if necessary to obtain a different action marking. Do not permit submittals with the following marking to be used at the project site, or elsewhere where work is in progress.
    - 1. Marking: "Revise and Resubmit"
- G. Marking: "Rejected".
- H. Other Action: Where the submittal is returned, marked with the Architect/Engineer's explanation, for special processing or other Contractor activity, or is primarily for information or record purposes, the submittal will not be marked.

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**SUBMITTAL COVERSHEET**

**Greenwich Public Schools- Life Skill Classroom and Related Work**

**Architect:**

**Fuller and D'Angelo, P.C.  
45 Knollwood Rd.  
Elmsford, NY 10523**

**Owner:**

**Greenwich Public Schools  
290 Greewnich Avenue  
Greenwich, CT. 06830**

**Contractor:** \_\_\_\_\_

**Contract:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_

**Fax:** \_\_\_\_\_

**Facility: Milbank School - Life Skills Classroom and Related Work**

Type of Submittal: Re-submittal: ☐ No ☐ Yes

☐ **Shop Drawings**

☐ **Product Data**

☐ **Schedule**

☐ **Sample**

☐ **Test Report**

☐ **Certificate**

☐ **Color Sample**

☐ **Warranty**

**Submittal Description:** \_\_\_\_\_

**Product Name:** \_\_\_\_\_

**Manufacturer:** \_\_\_\_\_

**Subcontractor:** \_\_\_\_\_

**Supplier:** \_\_\_\_\_

Spec. Section No.: \_\_\_\_\_ Drawing No(s): \_\_\_\_\_

Paragraph: \_\_\_\_\_ Rm. or Detail No(s): \_\_\_\_\_

Architect's Review Stamp

Contractor Review Statement: These documents have been checked for accuracy and coordinated with job conditions and Contract requirements by this office and have been found to comply with the provisions of the Contract Documents. Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Remarks:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**END OF SECTION**

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**SECTION 01 3553**  
**SITE SAFETY AND SECURITY PROCEDURES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. The safety requirements, which must be followed by the Contractor during the execution of this contract.
- B. The Contractor agrees that the work will be completed with the greatest degree of safety and:
  - 1. To conform to the requirements of the Occupational Safety and Health Act (OSHA) and the Construction Safety Act including all standards and regulations that have been or shall be promulgated by the governmental authorities which administer such acts, and shall hold the Owner, Owner's Representative, the Architect, and all their employees, consultants and representatives harmless from and against and shall indemnify each and everyone of them for any and all claims, actions, liabilities, costs and expenses, including attorneys fees, which any of them may incur as a result of non-compliance.
- C. Security measures including entry control, personnel identification, and miscellaneous restrictions.

**1.3 REFERENCES:**

- A. Code of Federal Regulations OSHA Safety and Health.

**1.4 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary of Contract: Use of premises and occupancy.
- B. Section 01 5000 - Temporary Facilities and Controls: Temporary lighting and site fence.
- C. Section 01 7000 - Execution.

**1.5 DEFINITIONS**

- A. Public shall mean anyone not involved with or employed by the contractor to perform the duties of this contract.
- B. Site shall mean the limits of the work area.
- C. Contractor shall mean the contractor, his/her subcontractors and any other person related to the contract execution.

**1.6 ENTRY CONTROL**

- A. The existing building contains a security alarm system maintained and operated by the Owner. Access into the existing building shall not be permitted unless the owner is notified and arrangements made to deactivate the system
- B. Restrict entrance of persons and vehicles into Project site and existing facilities.
- C. Allow entrance only to authorized persons with proper identification.
- D. Greenwich Public Schools will control entrance of persons and vehicles related to Greenwich Public Schools's operations.
- E. Coordinate access of Greenwich Public Schools's personnel to site in coordination with Greenwich Public Schools's security forces.
- F. Install substantial and durable general temporary enclosure of partially completed areas of construction. Provide locking entrances adequate to prevent unauthorized entrance, vandalism, theft and similar violations of project security. Ensure contractor accessibility to each working area not completed during the Summer months.
- G. Traffic Control

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1. Contractor shall maintain access for emergency vehicles, fireman and pedestrians and protect from damage all persons and property within the limits of and for the duration of the contract; all in accordance with the plans and specifications.
2. Conduct construction operations so that the traveling public and pedestrian safety is subjected to a minimum of hazard and delay.
3. Contractor shall perform the following minimum requirements as directed by Owner's Representative or Owner.
  - a. Keep the surface of the traveled way free from mounds, depressions, and obstructions of any type which could present hazards or annoyance to traffic.
  - b. Keep the surface of all pavements used by the public free and clean of all dirt, debris, stone, timber or other obstructions to provide safe traveled ways.
  - c. Control dust and keep the traveled way free from materials spilled from hauling and construction equipment.
  - d. Provide all cones, barricades, signs and warning devices as may be required and/or as ordered by Dan Watson, Director of Facilities to safely carry out the foregoing. All such signs and devices shall be fabricated and placed in accordance with the latest "Federal Manual on Uniform Control Devices". Use of Open Flares Is Prohibited.
  - e. Contractor shall cover with proper materials all open trenches at the close of each work day. Such plates to abut each other and be wedged at each end of trench to prevent plates from sliding open.
4. Ingress and Egress
  - a. Contractor shall provide and maintain at all times safe and adequate ingress and egress to and from site at existing or at new access points consistent with work, unless otherwise authorized by the Owner's Representative
5. If, upon notification by Owner's Representative, and the contractor fails to correct any unsatisfactory condition within 24 hours of being so directed, Owner's Representative will immediately proceed with adequate forces to properly maintain the project and the entire cost of such maintenance shall be deducted (back charged) from any moneys due the contractor
6. All traffic control costs shall include the base bid of furnishing all labor, material and equipment including the cost of any and all incidental required by job conditions as ordered by Greenwich Public Schools

**1.7 FIRE PREVENTION AND CONTROL**

- A. The Contractor shall provide Fire Extinguishers as follows: Provide type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical fires or grease-oil-flammable liquid fires. In other locations provide either type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.
  1. All required exits, fire alarm, security, automatic temperature control, PA, sprinkler and similar systems shall be maintained and operable throughout the entire construction contract.
    - a. Contractor(s) will be back-charged for all fines imposed for false alarms or service calls.
- B. Free access to fire hydrants and standpipe connections shall be maintained at all times during construction operations. Portable fire extinguishers shall be provided by the Construction Contractor and made conveniently available throughout the construction site. Contractor(s) shall notify their employees of the location of the nearest fire alarm box at all locations where work is in progress.
- C. The Contractor shall take all possible precautions for the prevention of fires. Where flame cutting torches, blow torches, or welding tools are required to be used within the building, their use shall be as approved by the Construction Manager at the site. When welding tools or torches of any type are in use, have available in the immediate vicinity of the work a fire extinguisher of the dry chemical 20 lbs. Type. The fire extinguisher(s) shall be provided and maintained by the Contractor doing such work.

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- D. Fuel for cutting and heating torches shall be gas only and shall be contained in Underwriters laboratory approved containers.
- E. Storage of gas shall be in locations as approved by the Owner and subject to Fire Department regulations and requirements.
- F. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within a building except with the express approval of the Owner and/or Architect and in accordance with local codes. On-site bulk storage of volatile liquids shall be outside the buildings at locations directed by the Owner, who shall determine the extent of volatile liquid allowed within the building at any given time.

**1.8 PERSONNEL IDENTIFICATION**

- A. Provide identification badge or other approved identification to each person authorized to enter premises.
- B. Maintain a list of accredited persons, submit copy to Greenwich Public Schools on request.
- C. Background checks and clearances shall be required for workers on this site, coordinate with Greenwich BOE.

**1.9 RESTRICTIONS**

- A. Do not allow cameras on site or photographs taken except by written approval of Greenwich Public Schools.

**PART 2 PRODUCTS -**

**2.1 MATERIALS**

- A. Refer to Section 01 5000 - Temporary Facilities and Controls for additional barrier requirements.
- B. Signs shall be made of sturdy plywood of 1/2" minimum thickness and shall be made to legible at a distance of 50 feet.

**PART 3 EXECUTION**

**3.1 GENERAL**

- A. In the performance of its contract, the Contractor shall exercise every precaution to prevent injury to workers and the public or damage to property.
  - 1. The Contractor shall, at their own expense, provide temporary structures, place watchmen, design and erect barricades, fences and railings, give warnings, display such lights, signals and signs, exercise such precautions against fire, adopt and enforce such rules and regulations, and take such other precautions as may be necessary, desirable or proper or as may be directed.
  - 2. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work to be done under this contract. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss including but not limited to:
    - a. All employees working in connection with this contract, and other persons who may be affected thereby.
    - b. All the work materials and equipment to be incorporated therein whether in storage on or off site; and including trees, shrubs, lawns, walks, pavements, facilities not designated for removal, relocation or replacement in the course of construction.
- B. The Contractor's duties and responsibilities for the safety and protection of the work: shall continue until such time as all the work is completed and contractor has removed all workers, material and equipment from the site, or the issuance of the certificate of final completion, whichever shall occur last.
- C. The Contractor shall use only machinery and equipment adapted to operate with the least possible noise, and shall so conduct his operations that annoyance to occupants of the site and nearby homes and facilities shall be reduced to a minimum

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- D. It shall be the responsibility of the Contractor to insure that all employees of the contractor and all subcontractors, and any other persons associated with the performance of their contract shall comply with the provisions of this specification.
- E. The Contractor shall clean up the site daily and keep the site free of debris, refuse, rubbish, and scrap materials. The site shall be kept in a neat and orderly fashion. Before the termination of the contract. The Contractor shall remove all surplus materials, falsework, temporary fences, temporary structures, including foundations thereof.
- F. The Contractor shall follow all rules and regulations put forth in the Code of Federal Regulations (OSHA Safety and Health Standards).
- G. The Contractor shall follow all CDC Covid 19 protocols required.

**END OF SECTION**

**SECTION 01 4000**  
**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Submittals.
- B. Testing and inspection agencies and services.
- C. Control of installation.
- D. Mock-ups.- see also Technical specification sections
- E. Manufacturers' field services.
- F. Defect Assessment.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 2100 - Allowances: Allowance for payment of noted services.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 4219 - Reference Standards.
- D. Section 01 6000 - Product Requirements: Requirements for material and product quality.

**1.4 REFERENCE STANDARDS**

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).

**1.5 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Access control - Test and Wiring Termination Reports: After each test/inspection, promptly submit two copies of report to Owner and Fuller and D'Angelo, P.C. and to Owners Representative.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.
    - f. Location in the Project.
    - g. Type of test/inspection.
    - h. Date of test/inspection.
    - i. Results of test/inspection.
    - j. Compliance with Contract Documents.
    - k. When requested by Fuller and D'Angelo, P.C., provide interpretation of results.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and or installation/application subcontractor to Owner and Fuller and D'Angelo, P.C., in quantities specified for Product Data.
  - 1. Certificates may be recent or previous test results on material or product, but must be acceptable to Owner and Fuller and D'Angelo, P.C..
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, for the Greenwich

Public Schools's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

- E. Manufacturer's Field Reports: Submit reports for Fuller and D'Angelo, P.C.'s benefit as contract administrator or for Greenwich Public Schools.
  - 1. Submit report in duplicate within 5 days of observation to Fuller and D'Angelo, P.C. for information.

#### **1.6 REFERENCES AND STANDARDS - See Section 01 4219**

- A. Should specified reference standards conflict with Contract Documents, request clarification from Fuller and D'Angelo, P.C. before proceeding.

#### **1.7 TESTING AND INSPECTION AGENCIES AND SERVICES**

- A. Greenwich Public Schools will employ services of an independent testing agency to perform certain specified testing; in addition to what is required by the contractor if required.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.1 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Fuller and D'Angelo, P.C. before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

#### **3.2 TESTING AND INSPECTION**

- A. See individual specification sections for testing and inspection required.
- B. Limits on Testing/Inspection Agency Authority:
  - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Agency may not approve or accept any portion of the Work.
  - 3. Agency may not assume any duties of Contractor.
  - 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
  - 1. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
  - 2. Provide incidental labor and facilities:
    - a. To provide access to Work to be tested/inspected.
    - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    - c. To facilitate tests/inspections.
  - 3. Notify Owner and Fuller and D'Angelo, P.C. and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

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4. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
  5. Arrange with Greenwich Public Schools's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Fuller and D'Angelo, P.C.. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

**3.3 CONTRACTOR'S TESTING AND INSPECTION**

- A. Testing and Inspections shall be conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction and as indicated in individual Specification Sections as the contractor's responsibility including:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Owner's Representative, Contractor, or Architect promptly of irregularities and deficiencies observed in the work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, through Owner's Representative, with copy to Contractor and to authorities having jurisdiction.
  4. Submitting again a final wiring termination report book of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and re-inspecting corrected work.

**3.4 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not conforming to specified requirements.

**END OF SECTION**

**SECTION 01 5000**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of each prime contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

**1.2 SECTION INCLUDES**

- A. Temporary sanitary facilities.
- B. Temporary Controls: Barriers, enclosures, and fencing.
- C. Temporary enclosures.
- D. Waste removal facilities and services enclosed by fencing.
- E. Construction aids and miscellaneous services and facilities.
- F. Temporary fire protection.
- G. Environmental protection.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 3553 - Site Safety and Security Procedures
- B. Section 01 3000 - Administrative Requirements for Submittals.
- C. Section 01 7000 - Execution for Progress cleaning requirements.

**1.4 SITE PLAN**

- A. Provide site plan indicating exiting, fencing, staging areas, and parking areas for construction personnel.

**1.5 REPORTS:**

- A. During the progress of the work, contractor shall submit copies of reports required by governing authorities, or necessary for the installation and efficient operation of temporary services and facilities.

**1.6 QUALITY ASSURANCE**

- A. Regulations: The contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
  - 1. Building code requirements.
  - 2. Health and safety regulations.
  - 3. Police, fire department and rescue squad rules.
  - 4. Environmental protection regulations
- B. Standards: The contractor shall comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

**1.7 PROJECT CONDITIONS**

- A. General: The Contractor shall provide each temporary service and facility ready for use at each location, when first needed to avoid delays in performance of work. Maintain, expand as required, and modify as needed throughout the progress of the work. Do not remove until services or facilities are no longer needed, or are replaced by the authorized use of completed permanent facilities.
- B. Temporary Use of Permanent Facilities: Regardless of previously assigned responsibilities for temporary services and facilities, the Installer of each temporary service or facility shall assume responsibility for its operation, maintenance and protection during use as a construction service or facility prior to the Owner's acceptance and operation of the facility.

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- C. Conditions of Use: Operate temporary services and facilities in a safe and efficient manner. Do not overload, and do not permit temporary services and facilities to interfere with the progress of work, or occupancy of existing facility by owner. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.
- D. Temporary Utilities: Do not permit freezing of pipes, flooding or intrusion of any water from the elements.
- E. Temporary Construction and Support Facilities: Maintain temporary facilities in a manner to prevent discomfort to users. Take necessary fire prevention measures. Maintain temporary facilities in a sanitary manner so as to avoid health problems. Protect persons from entering a construction area, take all and full precautions.
- F. Security and Protection: Maintain site security and protection facilities in a safe, lawful, publicly acceptable manner. Take measures necessary to prevent site erosion.

**1.8 TEMPORARY UTILITIES**

- A. Greenwich Public Schools will provide the following:
  - 1. Electrical power, consisting of connection to existing facilities.
  - 2. Water supply, consisting of connection to existing facilities.
- B. Provide all electrical power, lighting, water, and ventilation required for construction purposes.
- C. Existing toilet facilities may not be used.
- D. Ventilate rooms well before School Start with time to allow any odors to be eliminated.
- E. Use trigger-operated nozzles for water hoses, to avoid waste of water.

**1.9 DIVISION OF RESPONSIBILITIES**

- A. The Contractor is responsible for the following:
  - 1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, as well as the costs and use charges associated with each facility.
  - 2. Plug-in electric power cords and extension cords.
  - 3. Supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
  - 4. Special power requirements for installation of its own work.
  - 5. Its own storage sheds if required.
  - 6. Its own tool storage boxes.
  - 7. Collection of general waste and debris and disposing into containers provided by the Contractor.
  - 8. Secure lockup of its own tools, materials and equipment.
  - 9. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- B. The Contractor is responsible and shall pay costs for the following:
  - 1. Temporary toilets, including disposable supplies.
  - 2. Containers for non-hazardous waste and debris.
  - 3. Temporary enclosures of openings.
  - 4. Disposal of wastes containers.
  - 5. Attic Ventilation
  - 6. Barricades, warning signs, and lights.
  - 7. Site/construction enclosure fence, around dumpsters and storage areas.
  - 8. Temporary Fire Protection
  - 9. Temporary dustproof protection when making dust.

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- C. The Contractor shall maintain all existing systems, including but not limited to, power, lighting, fire alarm, intercom, PA etc., within the existing building operational at all times for Owner occupancy and construction.

#### **1.10 USE CHARGES**

- A. General: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect the Owner's Representative. The Architect and Owner will not accept a prime contractor's cost or use charges for temporary services or facilities as a basis of claim for an adjustment in the Contract Sum or the Contract Time.
  - 1. Water Service Use Charges: Water from the Owner's existing water system may be used without metering, and without payment for use charges.
  - 2. Electric Power Service Use Charges: Electric power from the Owner's existing system may be used without payment of use charges.
  - 3. Temporary Utility Services: Where Owner's existing services is inadequate or would disrupt owners use of the existing facility, contractor shall provide utility services for the temporary use at the project site from the utility company, and pay all costs, including use charges.

#### **1.11 TELECOMMUNICATIONS SERVICES**

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
  - 1. Cellular phone connection for on site superintendent at minimum.
  - 2. Email: Account/address reserved for project use.
  - 3. Facsimile Service: Fax-to-email software on personal computer.

#### **1.12 TEMPORARY SANITARY FACILITIES**

- A. Contractor shall provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Toilets: Use of the Owner's existing toilet facilities will not be permitted
- C. The Contractor shall maintain daily in clean and sanitary condition.
- D. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations which will best serve the project's needs. They shall be located within fenced area.
  - 1. Supply and maintain toilet tissue, paper towels, paper cups and other disposable materials as appropriate for each facility, including Owner's Representative's temporary offices. Provide covered waste containers for used material.
  - 2. Install self-contained toilets to the extent permitted by governing regulations.

#### **1.13 BARRIERS**

- A. The Contractor shall, provide Barricades, Warning Signs and Lights: Comply with recognized standards and code requirements for erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public, of the hazard being protected against. Provide lighting where appropriate and needed for recognition of the facility, including flashing red lights where appropriate
  - 1. Sign Materials: For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated. Provide exterior grade acrylic-latex-base enamel for painting sign panels and applying graphics.
- B. The Contractor shall, Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations .

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- C. Plywood: For temporary safety barriers, walls and doors and similar direct-contact uses, provide exterior type, 5/8" thick minimum prime and finish painted plywood, over wood stud back-up. do not leave construction space open to remainder of building.

**1.14 FENCING**

- A. The Contractor shall be responsible for its own fencing as required to secure stored material and waste containers.
- B. Construction: Commercial grade chain link fence.
- C. Provide 6 foot high fence around construction waste containers and the work areas on site. .
- D. Locate where indicated, or if not indicated, enclosed portions of the site determined to be sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except through entrance gates.
  - 1. Material:
    - a. Steel fencing: Galvanized Chain Link and galvanized gates (non-climbable size).
    - b. Fabric: No. 9 GA galvanized, steel wire mesh, furnish one-piece fabric widths for fencing up to 6' in height indicated in the Contract Documents.
    - c. Framing and Accessories: End, Corner and Pull posts: 2.375" OD steel pipe.
    - d. Line Posts: Space 10'-0" O.C. maximum. 1.90" steel pipe or 1.875" x 1.625 C-sections.
    - e. Fence Rails: Locate at top and bottom of fabric. Post brace assembly - manufacturer's standard.
    - f. Wire ties: For tying fabric to line posts use wire ties spaced 12" O.C.
    - g. Height: 6'

**1.15 INTERIOR DUST PROTECTION AND CONTROL**

- A. Where construction operation create dust provide plastic coverings, 6 mil plastic, covering door openings, office computers, racks, cabinetry, shelving and other items not removed from work area. Tape all edges tight.
  - 1. Seal all UV, supply and return registers.
  - 2. Schedule and coordinated with Greenwich Public School District.
  - 3. Refer to 01 7000 - Execution for final cleaning requirements.
  - 4. Maintain ventilation systems and HV systems as long as possible, finish work on same as soon as possible and make HV / HVAC systems operate with the understanding that time is of the essence to provide an air circulation atmosphere for the existing system. Schedule and coordinate with Owner so as not to interfere with Owners occupancy requirements.
- B. Provide temporary partitions as indicated or required to separate work areas from Greenwich Public Schools-occupied areas, to prevent access and penetration of dust and moisture into Greenwich Public Schools-occupied areas, and to prevent damage to existing/new materials and equipment.

**1.16 SECURITY**

- A. The contractor shall secure and protect facilities and services and shall be the responsible for and pay for all costs in their bid.
- B. Provide security and facilities to protect Work, existing facilities, and Greenwich Public Schools's operations from unauthorized entry, vandalism, or theft.
- C. Temporary Fire Protection: The Contractor shall provide Fire Extinguishers as follows:: Provide type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical fires or grease-oil-flammable liquid fires. In other locations provide either type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case

- D. The existing building contains a security alarm system maintained and operated by the Owner. Access into the existing building shall not be permitted unless the owner is notified and arrangements made to deactivate the system.

#### **1.17 VEHICULAR ACCESS AND PARKING**

- A. The contractor shall Coordinate access and haul routes with governing authorities and Greenwich Public Schools.
- B. The contractor shall Provide and maintain access to fire hydrants free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

#### **1.18 WASTE REMOVAL**

- A. The Contractor shall provide containers, at grade, sufficient for the depositing of non-hazardous/non-toxic waste materials, and shall remove such waste materials from project site as required or directed by the Owner's representative.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Contractors shall not utilize the Owner's bins or dumpsters.
- B. The Contractor shall broom clean the site work area at the end of each work day.
  - 1. If the contractor fails to clean areas at the end of each work day the Owner shall perform the cleaning and back charge the contractor accordingly.
- C. The contractor shall be responsible for daily cleaning up of spillage and debris resulting from its operations and from those of its subcontractors; and shall be responsible for complete removal and disposition of hazardous and toxic waste materials.
  - 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. Burying or burning of waste materials on the site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- E. Site: The Contractor shall maintain Project site free of waste materials and debris.
- F. Installed Work: Keep installed work clean. The Contractor shall 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.

#### **1.19 MISCELLANEOUS PROVISIONS**

- A. Dewatering Facilities and Drains: General: For temporary drainage and dewatering facilities and operations not directly associated with performance of work included under individual work sections, comply with dewatering requirements of applicable sections. Where feasible, utilize the same facilities. Maintain site excavations and construction free of water.

#### **1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 6000**  
**PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 4000 - Quality Requirements: Product quality monitoring.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- C. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

**1.4 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
- C. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

**1.5 SUBMITTALS Refer to Section 01 3000**

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
  - 1. Submit within 10 days after date of Letter of Award.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate any related utility, HVAC and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances or drains.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

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1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

#### **1.6 ASBESTOS**

- A. All products, materials, etc. used in conjunction with this Project shall be Asbestos Free.
  1. **Contractor shall provide a letter to the Owner stating that no asbestos containing material has been used in this project.**
  2. Should the contractor run across any materials that appear to contain asbestos they should notify immediately the Owner or Owners Representative. Do not engage that material prior to.

### **PART 2 PRODUCTS**

#### **2.1 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises .
- B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Greenwich Public Schools, or otherwise indicated as to remain the property of the Greenwich Public Schools, become the property of the Contractor; remove from site.

#### **2.2 NEW PRODUCTS**

- A. Provide all new products.
- B. DO NOT USE products having any of the following characteristics:
  1. Made outside the United States, its territories, Canada, or Mexico.
  2. Made using or containing CFC's or HCFC's.
  3. Containing lead, cadmium, asbestos.

#### **2.3 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named. Submit on form attached and in accordance with Information to Bidders.

### **PART 3 EXECUTION**

#### **3.1 SUBSTITUTION PROCEDURES**

- A. Refer to Instruction to Bidders.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. A request for substitution constitutes a representation that the submitter:
  1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  2. Agrees to provide the same warranty for the substitution as for the specified product.
  3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Greenwich Public Schools.
  4. Waives claims for additional costs or time extension that may subsequently become apparent.
- D. 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 revision to the Contract Documents.

#### **3.2 TRANSPORTATION AND HANDLING**

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

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- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

### **3.3 STORAGE AND PROTECTION**

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. Provide off-site storage and protection when site does not permit on-site storage or protection.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**SUBSTITUTION REQUEST FORM**

**SUBSTITUTION REQUEST No. \_\_\_\_\_**

(After the Bidding Phase)

Project: Life Skill Classroom and Related Work

Substitution Request Number: \_\_\_\_\_

From: \_\_\_\_\_

Date: \_\_\_\_\_

A/E Project Number: 22XX-23

Contract For: General Construction

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_

Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Proposed Substitution:

Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_

model no.: \_\_\_\_\_

Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_

History: \_\_\_\_\_ New product \_\_\_\_\_ 2-5 years old \_\_\_\_\_ 5-10 yrs old \_\_\_\_\_ More than 10 years old

Differences between proposed substitution and specified product:

Point-by-point comparative data attached - REQUIRED

Reason for not providing specified item: \_\_\_\_\_

Similar Installation:

Project: \_\_\_\_\_ Architect: \_\_\_\_\_

Address: \_\_\_\_\_ Owner: \_\_\_\_\_

Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work: \_\_\_\_ No \_\_\_\_ Yes; explain

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_)

Proposed substitution changes Contract Time: \_\_\_\_ No \_\_\_\_ Yes Add \_\_\_\_\_ Deduct \_\_\_\_\_ days.

Supporting Data Attached: \_\_\_\_ Drawings \_\_\_\_ Product Data \_\_\_\_ Samples \_\_\_\_ Tests Reports

The Undersigned certifies:

Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.

Same warranty will be furnished for proposed substitution as for specified product.

Same maintenance service and source of replacement parts, as applicable, is available.

Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.

Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.

Proposed substitution does not affect dimensions and functional clearances.

Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

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Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

Signed by: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Attachments:

OWNER/ARCHITECT/CM REVIEW AND ACTION

\_\_\_\_ Substitution approved - Make submittals in accordance with Specification Section 01330

\_\_\_\_ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.

\_\_\_\_ Substitution rejected - Use specified materials.

\_\_\_\_ Substitution Request received too late - Use specified materials.

: \_\_\_\_\_ Date: \_\_\_\_\_

Additional Comments: \_\_ Contractor \_\_ Subcontractor \_\_ Supplier \_\_ Manufacturer \_\_ A/E

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**END OF SECTION**

**SECTION 01 7000  
EXECUTION**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Inspections prior to start of work.
- B. Examination, preparation, and general installation procedures.
- C. Requirements for replacement work, including selective removals.
- D. Pre-installation meetings.
- E. Field engineering and surveying.
- F. General installation of products.
- G. Progress cleaning.
- H. Protection of installed construction.
- I. Correction of the Work.
- J. Surveying for laying out the work.
- K. Cleaning and protection.
- L. Waste Management
- M. Final Cleaning.
- N. General requirements for maintenance service.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary of Contract: Limitations on working in existing building, continued occupancy, work sequence, identification of salvaged materials., and relocated materials.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties .
- F. Individual Product Specification Sections:
  - 1. Advance notification to other sections of openings required in work of those sections.

**1.4 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

**1.5 PROJECT CONDITIONS**

- A. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- B. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
  - 1. Outdoors: Limit conduct of especially noisy exterior work to hours permitted under the local Noise Ordinance.

- C. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

#### 1.6 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of work of separate sections.
- F. After Greenwich Public Schools occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Greenwich Public Schools's activities.
- G. Alterations: Where applicable, requirements of the contract documents apply to alteration work in the same manner as to new construction. Refer to drawings for specific requirements of alteration work. Primarily, alterations can be described as normal architectural, mechanical and electrical alterations. Contractors shall review phasing and scheduling of the work to understand that certain areas of work must be completed and occupied prior to start of other work. This is essential to the Owner in their ability to maintain the educational programs during construction.

#### 1.7 CODES, PERMITS, FEES, ETC.

- A. Refer to Owner Contractor Agreement for additional requirements.
- B. **The Owner shall file and obtain and pay for the Building Permit.**
- C. The contractor(s) and sub- Contractors shall pick-up the Building Permits at Town Hall, Building Department and submit all required insurances etc. to same to "pull" permits for each trade required.
- D. The Contractor shall furnish and pay for all permits, fees and other installation costs required for the various installations by governing authorities and utility companies; prepare and file drawings and diagrams required; arrange for inspections of any and all parts of the work required by the authorities and furnish all certificates necessary to the Owner and Construction Manager as evidence that the work installed under this Section of the Specifications conforms with all applicable requirements of the Municipal and State Codes, National Board of Fire Underwriters, National Electric Code, as applicable.
- E. Any items of work specified herein and shown on the drawings which conflict with aforementioned rules, regulations and requirements, shall be referred to the Owner and Construction Manager for decision, which decision shall be final and binding.
- F. The building is to be constructed under the following Rules and Regulations of the Building Codes of the State of Connecticut and consist of the following
  - 1. Current Building Code of State of Connecticut

#### 1.8 MANDATORY OSHA CONSTRUCTION SAFETY AND HEALTH TRAINING

- A. All laborers, workers and mechanics working on the site are required to be certified as having successfully completed an OSHA construction safety and health course of at least 10 hours prior to performing any work on the project.

## **PART 2 PRODUCTS**

### **2.1 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Prior to start of construction take photographs, videos or similar documentation as evidence of existing project conditions as follows:
  - 1. Exterior views: Spaces adjacent to all work areas.
- B. Verify that existing substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Provide Full waste management, clean all areas daily, place all removals for disposal in dumpsters, remove dumpsters in a timely manner to keep site clean. Do not throw items in dumpsters use chutes as required.
- E. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.2 PREPARATION**

- A. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond, for new walls or opening in-fills and for all painting tasks.

### **3.3 PRE-INSTALLATION MEETINGS**

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify the Architect and Owner four days in advance of this Pre- Installation meeting date. It is the Contractors Sole Responsibility to Schedule this Meeting prior to construction start.
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of examination, preparation and installation procedures.
  - 2. Review coordination with related work.
  - 3. Show Mock-ups if applicable
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Fuller and D'Angelo, P.C., Greenwich Public Schools, participants, and those affected by decisions made.

### **3.4 GENERAL INSTALLATION REQUIREMENTS**

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Make neat transitions between different surfaces, maintaining texture and appearance.

### **3.5 ALTERATIONS**

- A. Drawings showing existing construction and utilities are based on casual field observation only.
  - 1. Verify that construction and utility arrangements are as shown.

2. Report discrepancies to Owner's Representative and Architect before disturbing existing installation.
3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Remove existing work as indicated and as required to accomplish new work.
  1. Remove items indicated on drawings.
  2. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
- C. Services (Including but not limited to HVAC, Plumbing, and Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
  1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
  2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
  3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
    - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
    - b. Provide temporary connections as required to maintain existing systems in service.
  4. Verify that abandoned services serve only abandoned facilities.
  5. Remove abandoned pipe, ducts, conduits, and equipment ; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- D. Protect existing work to remain.
  1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
  2. Repair adjacent construction and finishes damaged during removal work.
  3. Patch as specified for patching new work.
- E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
  1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Fuller and D'Angelo, P.C..
- F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- G. Remove debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- H. Do not begin new construction in alterations areas before removals are complete.
- I. Comply with all other applicable requirements of this section.

### **3.6 CUTTING AND PATCHING**

- A. See Alterations article above for additional requirements.
- B. Perform whatever cutting and patching is necessary to:
  1. Complete the work.
  2. Fit products together to integrate with other work.
  3. Provide openings for penetration of, electrical, and other services.
  4. Match work that has been cut to adjacent work.
  5. Repair areas adjacent to cuts to required condition.
  6. Repair new work damaged by subsequent work.

7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Restore work with new products in accordance with requirements of Contract Documents.
- E. Patching:
  1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
  2. Match color, texture, and appearance.
  3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- F. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

**3.7 FIRE PREVENTION AND CONTROL Refer to Section 01 3553**

**3.8 WATCHMAN**

- A. The Owner will not provide watchman. The Contractor will be held responsible for loss or injury to persons or property or work where his work is involved and shall provide such watchman and take such precautionary measures as he may deem necessary to protect his own interests.

**3.9 SECURITY SYSTEM**

- A. The existing building contains a security alarm system maintained and operated by the Owner. Access into the existing building shall not be permitted unless the owner is notified and arrangements made to deactivate the system.

**3.10 PROGRESS CLEANING**

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.
- E. The Contractor is responsible for their own daily debris removal into containers provided by the Contractor. Working areas are to be broom swept on a daily basis by the Contractor.
- F. The Contractor is responsible to provide dust protection for their construction-related activities.

**3.11 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

**3.12 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation if removed and reset.

**3.13 FINAL CLEANING**

- A. Final cleaning shall be the responsibility of the Contractor and all costs for final cleaning shall be included in the Base Bid. Final cleaning responsibility shall be limited to all new additions and areas where renovations occur.
- B. Execute final cleaning prior to final project assessment.
- C. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury. Remove Fencing and leave site in a clean manner.
- D. Remove labels that are not permanent.
- E. Leave Project clean and ready for occupancy and School use.
- F. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

**3.14 MAINTENANCE**

- A. Provide service and maintenance of components indicated in specification sections.

**SECTION 01 7800**  
**CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of each prime Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

**1.2 SECTION INCLUDES**

- A. Project Record Documents.
- B. Maintenance Data.
- C. Warranties and Bonds.

**1.3 RELATED REQUIREMENTS**

- A. Agreement.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Individual Product Sections: Specific requirements for operation and/or maintenance data.
- D. Individual Product Sections: Warranties required for specific products or Work.

**1.4 SUBSTANTIAL COMPLETION**

- A. Refer to the Agreement for additional requirements.
- B. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion:
  - 1. Prepare a list of items to be completed and corrected, the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner and Architect of pending insurance changeover requirements.
  - 3. Obtain and submit releases permitting Owner's Representative and Architect unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
- C. Prior to issuance of the Certificate of Substantial Completion, submit, in writing, a request to the Owner, Owner's Representative, and Architect a request to perform site inspection for the purpose of preparing a "punch list".
- D. On receipt of request Owner's Representative and Architect will prepare a punch list. Certificate of Substantial Completion after completion of all punch list items or will notify Contractor of items, either punch list list or additional items identified by Architect, that must be completed or corrected before certificate will be issued
- E. Certificate of Substantial Completion will be issued after completion of all punch list items. Owner's Representative and Architect will notify Contractor of items, either punch list or additional items identified by Architect, that must be completed or corrected before certificate will be issued. After completion of "punch list" items submit the following:
  - 1. Application for Payment showing 100 percent completion for portion of the Work claimed as substantially completed the following:
  - 2. Warranties (guarantees).
  - 3. Maintenance Manuals and instructions.
  - 4. Indoor Quality Report
  - 5. Final cleaning.
  - 6. List of incomplete Work, recognized as exceptions to Architect's "punch list". .
  - 7. Architect's punch list certifying all punch list items have been completed and signed off by the Owner's Representative and Contractor.

8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish and similar elements.
- F. Request re inspection when the Work identified in previous inspections as incomplete is completed or corrected, after one reinspection further architectural charges will be back-charged to the contractor on a T+M basis.
  1. If necessary, re inspection will be repeated and the contractor shall pay for all additional inspections.

#### **1.5 FINAL COMPLETION**

- A. Refer to the Agreement for additional requirements.
- B. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
  1. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner's Representative and Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will not process a final Certificate for Payment until after the inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
- C. Following Final Inspection acceptance of work submit the following:
  1. Submit Owners Affidavit of Final Payment.
  2. Submit a final Application for Payment.
  3. Submit certified copy of Architect's Substantial Completion punch list items endorsed and dated Contractor and Owner's Representative certifying each item has been completed or otherwise resolved for acceptance.
  4. Release of liens from contractor and all entitles of contractor.
  5. Consent of Surety to Final Payment.
  6. Final Liquidated Damages settlement statement, if applicable.
  7. Contractor's Affidavit of Release of Liens (AIA G706A).
  8. Contractors Affidavit of Payment of Debts and Claims (AIA G706)
  9. Certification of Payment of Prevailing Wage Rates.
  10. Contractor's certified statement that no asbestos containing material was incorporated into the project.
  11. HVAC and Plumbing sub contractors must provide test results upon completion from a State of Connecticut accredited testing lab certifying that all pipe insulation and joints on this project contain no asbestos.
    - a. This certification shall be based on a sampling of 10% of all linear feet of pipe insulation (unless manufacturer's certificate is submitted).
  12. All items per checklist at end of this section (no retainage reductions will be allowed until all closeout paperwork is received).

#### **1.6 SUBMITTALS**

- A. Contractor shall submit all documentation identified in this section within thirty (30) days from the time the Contractor submits the list of items to be corrected, as referred to in the Agreement in addition to other rights of the Owner set forth elsewhere in the Contract Documents, to include but not limited to withholding of final payment. If the documentation has not been submitted within thirty (30) day period, the Owner will obtain such through whatever means necessary. The Contractor shall solely be responsible for all expenses incurred by the Owner, provided the Owner has advised the Contractor of this action thirty 30 days prior to the culmination date and again, seven 7 days prior to the culmination date by written notice
- B. Project Record Documents: Submit documents to Fuller and D'Angelo, P.C. with claim for final Application for Payment.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.1 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the Contract.
  - 5. Reviewed shop drawings, product data, and samples.
  - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Greenwich Public Schools.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Field changes of dimension and detail.
  - 2. Details not on original Contract drawings.

**3.2 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and approved Shop Drawings at the project site.
- B. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
  - 1. Accurately, neatly and clearly record information in an understandable drawing technique.
- C. Content: Types of items requiring marking include, but are not limited to, the following:
  - 1. Dimensional changes to Drawings.
  - 2. Locations and depths of underground utilities.
  - 3. Changes made by Change Order or Construction Change Directive.
  - 4. Details not on the original Contract Drawings.
- D. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
- E. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- F. Provide final record drawings on CD in PDF format.

**3.3 FORMAT**

- A. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Contractor shall certify and sign. Provide one B+W set on full size set.
- B. Identify Record Drawing as follows:
  - 1. Project name.
    - a. Date.
    - b. Designation "PROJECT RECORD DRAWINGS."

- c. Name of Architect and Owner's Representative.
- d. Name of Contractor.
- e. Contractor shall certify and sign each drawing

### **3.4 MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For Each Product, Applied Material, and Finish:
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

### **3.5 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into durable manuals for Greenwich Public Schools's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- D. Prepare data in the form of an instructional manual.
- E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Fuller and D'Angelo, P.C., Consultants, Contractor and subcontractors, with names of responsible parties.
- H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

### **3.6 WARRANTIES**

- A. Obtain warranties executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Greenwich Public Schools's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties until time specified for submittal.

**CHECKLIST FOR PROJECT CLOSEOUT  
AND PROCESSING OF FINAL PAYMENT**

**JOB TITLE: - Greenwich Public Schools Life Skill Classroom and Related Work Milbank School**

**BOARD OF EDUCATION BID NUMBER; 2404-23**

**CLOSE-OUT SUBMITTALS: (As Applicable)**

**[ ] WAGE & SUPPLEMENTS VERIFICATION FORM (COPY ATTACHED).**

**THREE (3) 3-RING BINDER BROCHURES OF OPERATION AND MAINTENANCE  
MANUALS FOR ALL EQUIPMENT INSTALLED ON THE PROJECT INCLUDING  
THE FOLLOWING:**

- [ ] TYPED OR PRINTED INSTRUCTIONS COVERING THE CARE AND OPERATIONS OF  
MATERIAL, EQUIPMENT AND SYSTEMS FURNISHED AND INSTALLED.**
- [ ] MANUFACTURERS INSTRUCTION BOOKS, DIAGRAMS, SPARE PARTS LISTS  
COVERING ALL EQUIPMENT.**
- [ ] ALL APPROVED SHOP DRAWINGS.**
- [ ] CERTIFICATES OF COMPLIANCE AND INSPECTION. (WHERE APPLICABLE  
PLUMBING, ELECTRIC, ETC.)**
- [ ] EVIDENCE OF COMPLIANCE WITH REQUIREMENTS OF GOVERNING  
AUTHORITIES (CERTIFICATES OF INSPECTION ELECTRICAL).**
- [ ] CERTIFICATES OF INSURANCE FOR PRODUCTS AND COMPLETED  
OPERATIONS.**
- [ ] NOTARIZED STATEMENT THAT ONLY NON-ASBESTOS MATERIALS  
WERE INSTALLED ON THIS PROJECT.**
- [ ] FULLY EXECUTED CERTIFICATE OF SUBSTANTIAL COMPLETION: AIA  
G704.**
- [ ] CONTRACTOR'S WRITTEN TWO-YEAR WARRANTY AND EXTENDED  
WARRANTIES (IF ANY REQUIRED).**
- [ ] PROJECT RECORD DOCUMENTS: SECTION 01 7800.**
- [ ] AS-BUILT DRAWINGS.**

**EVIDENCE OF PAYMENT AND RELEASE OF LIEN**

- [ ] CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS: AIA G706.**
- [ ] CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS - AIA G706A PRIME  
CONTRACTORS AND SUBCONTRACTORS.**
- [ ] CONSENT OF SURETY TO FINAL PAYMENT AIA G707.**

**REFER TO SECTION 017800 PAR 1.4 AND 1.5 FOR ADDITIONAL REQUIREMENTS. FINAL  
PAYMENT WILL NOT BE PROCESSED UNTIL ALL ITEMS INDICATED ARE RECEIVED  
IN ACCORDANCE WITH SECTION 01 7800 - CLOSEOUT SUBMITTALS.**

**END OF SECTION**

**SECTION 03 3000**  
**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Partial slab Removals.
- B. Patching of Floors and Slabs on grade.
- C. Reinforcing for new slabs patches to existing slabs.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Finishes.
- G. Mix design.
- H. Placement procedure.

**1.3 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- B. REFERENCE STANDARDS
  - 1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.
  - 2. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
  - 3. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
  - 4. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).
  - 5. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
  - 6. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2007b (Reapproved 2014).
  - 7. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.
  - 8. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.
  - 9. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
  - 10. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
  - 11. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
  - 12. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.
  - 13. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
  - 14. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.
- C. ASTM C1708/C1708M - Standard Test Methods for Self-leveling Mortars Containing Hydraulic Cements; 2016.
- D. SUBMITTALS
  - 1. See Section 01 3000 - Administrative Requirements, for submittal procedures.

2. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
  3. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
  4. Mix Design: Submit proposed concrete mix design.
    - a. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
  5. Test Reports: Submit report for each test or series of tests specified.
- E. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
  2. Steel reinforcement and accessories.
  3. Curing compounds.
  4. Bonding agents.
  5. Adhesives.
  6. Joint-filler strips.
  7. Repair materials.

#### **1.4 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

#### **1.6 PROJECT CONDITIONS**

- A. Coordinate with the work of all other sections and separate contracts.

### **PART 2 PRODUCTS**

#### **2.1 FORMWORK**

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117. **Do not disturb soils with formwork.**

#### **2.2 REINFORCEMENT MATERIALS**

- A. Comply with requirements of Section 03 2000.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
  1. Type: Deformed billet-steel bars. For reinforcing and in between patches and existing slabs.
  2. Finish: Epoxy coated in accordance with ASTM A775/A775M, unless otherwise indicated.
- C. Steel Welded Wire Reinforcement (WWR): Class A epoxy coated, deformed type, ASTM A884/A884M.
  1. Form: Flat Sheets.
  2. Mesh Size: 6 x 6.
  3. Wire Gage: W 10 x W 10.
- D. Reinforcement and Accessories:
  1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
  2. Bonding agents
  3. Provide epoxy coated components for placement within 1-1/2 inches of weathering surfaces.

### **2.3 CONCRETE MATERIALS**

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
- C. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

### **2.4 ACCESSORY MATERIALS**

- A. Self-Leveling Cementitious Concrete Floor Topping:
  - 1. Minimum Compressive Strength at 28 Days, ASTM C1708/C1708M: 7,000 pounds per square inch.
  - 2. Manufacturers:
    - a. LATICRETE International, Inc; LATICRETE SUPERCAP SC650-MC: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).

### **2.5 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
  - 1. Manufacturers:
    - a. Kaufman Products Inc; SureBond: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - b. SpecChem, LLC; Strong Bond Acrylic Bonder: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - c. W. R. Meadows, Inc; ACRY-LOK-: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - d. Substitutions: See Section 01 2500 Substitution Procedures.
- B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

### **2.6 CURING MATERIALS**

- A. Moisture-Retaining Sheet: ASTM C171.
  - 1. Polyethylene film, clear, minimum nominal thickness of 4 mil, 0.004 inch.
- B. Water: Potable, not detrimental to concrete.

### **2.7 REPAIR MATERIALS**

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
  - 4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

### **2.8 CONCRETE MIX DESIGN**

- A. Concrete Strength: 4,000 psi, Establish required average strength for concrete on the basis of field experience, as specified in ACI 301.
  - 1. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
  - 2. Compressive Strength: Not less than 4000 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Normal Weight Concrete:
  - 1. Water-Cement Ratio: Maximum 0.45 .

2. Total Air Content: 6 percent, determined in accordance with ASTM C173/C173M.
3. Maximum Slump: 4 inches.
4. Maximum Aggregate Size: 1/4 inch.
5. Use bonding agent to adhere to existing slabs

## **2.9 MIXING**

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### **3.2 PREPARATION**

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Coordinate placement of embedded items with erection of concrete and placement of accessories.
- C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
  1. Use latex bonding agent only for non-load-bearing applications.
- D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
  1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

### **3.3 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS**

- A. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.
- B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- C. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

### **3.4 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Ensure reinforcement and formed construction joint devices will not be disturbed during concrete placement.
- D. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.
- F. Finish floors level with adjacent existing concrete floors
- G. Prep for finish flooring as required.

### **3.5 SLAB JOINTING**

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.

### **3.6 SEPARATE FLOOR TOPPINGS**

- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required reinforcing.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Place concrete floor toppings to required lines and levels.

### **3.7 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling In: Fill in holes and openings left in concrete structures and existing concrete locker bases, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

### **3.8 CONCRETE FINISHING**

- A. Repair surface defects, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include resilient flooring, thin set ceramic tile, and Epoxy flooring.

### **3.9 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Surfaces Not in Contact with Forms:
  - 1. Final Curing: Begin after initial curing but before surface is dry.
    - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.

### **3.10 FIELD QUALITY CONTROL**

- A. An independent testing agency may perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

### **3.11 DEFECTIVE CONCRETE**

- A. Repair or replacement of defective concrete will be determined by the Fuller and D'Angelo, P.C.. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- B. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Fuller and D'Angelo, P.C. for each individual area.

**3.12 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION**

**SECTION 06 1000  
ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Miscellaneous framing and gypsum board.
- B. Concealed wood blocking, nailers, furring and supports.
- C. Miscellaneous wood nailers, furring, and grounds.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 3000 - Cast-in-Place Concrete: Setting pins in concrete.
- C. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.
- D. Section 12 3200 - Plastic Laminated Casework.

**1.4 REFERENCE STANDARDS**

- A. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- B. PS 20 - American Softwood Lumber Standard; 2010.
- C. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2004, and supplements.
- D. WWP A G-5 - Western Lumber Grading Rules; 2011.

**1.5 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on each type of lumber and fastener.
- C. Material Safety Data Sheets.

**1.6 QUALITY ASSURANCE**

- A. Installer Qualifications:
  - 1. A firm (Installer) with not less than 5 years experience installing comparable carpentry work, employing personnel skilled in the work specified.
  - 2. Pre-Application Conference: Attend the pre-roofing conference to discuss how the carpentry work will be performed and coordinated with other related work
  - 3. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
    - a. Acceptable Lumber Inspection Agencies: Any agency with rules approved by American Lumber Standards Committee.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

**1.8 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a two-year period commencing on Date of Substantial Completion.

**1.9 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a two (2) year period after Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.1 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. Species: Douglas Fir, Structural Grade unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.

### **2.2 DIMENSION LUMBER**

- A. Grading Agency: Western Wood Products Association; WWPA G-5.
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: Kiln-dry or MC15. Provide fire retardant material in all concealed spaces..

### **2.3 CONSTRUCTION PANELS**

- A. Wall Sheathing: Gypsum, complying with requirements of ASTM C1396/C1396M for gypsum sheathing, V-shaped long edges, 5/8 inch Type X fire resistant.
- B. Plywood: Exterior grade APA rated Type CDX underlayment plywood.

### **2.4 ACCESSORIES**

- A. Fasteners and Anchors:
  - 1. Stainless steel.
  - 2. Use screws wherever possible, minimum size diameter #12. If nails are used they shall be annular ring shank type. Do not use dry wall screws to secure wood blocking assemblies.
  - 3. Use stainless steel threaded adhesive anchors for fastening wood blocking to masonry.
    - a. Hilti "HIT-HY 200A" or approved equal for solid masonry locations.
    - b. Hilti "HIT-HY 270" or approved equal with composite mesh sleeves, for hollow masonry locations.
  - 4. Metal and Finish: Stainless steel for all applications and locations.
  - 5. Anchors: Toggle bolt type for anchorage to hollow masonry.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Coordinate installation of rough carpentry members specified in other sections.

### **3.2 INSTALLATION - GENERAL**

- A. Coordinate the installation of carpentry items with the installation of the door system, and related work.
- B. Set carpentry work plumb and true, except provide slope at the top surfaces of horizontal members as indicated.
- C. Space fasteners to achieve adequate holding power, generally as follows:
  - 1. Anchor bolts embedded in concrete, drilled anchors into concrete or masonry, minimum embedment 1" and minimum edge distance 2", screws into a steel deck or structural steel member, or screws into wood framing: 12 inches on center.
  - 2. Install two rows of fasteners on blocking wider than 6 inches.
  - 3. Fit carpentry work neatly scribed and cut to fit within 1/8 inch of adjoining materials. Position furring, nailers, blocking, shims and similar supports for the proper attachment of subsequent work.
  - 4. All fastening work to comply with wind loading of door frame system.

### **3.3 FRAMING INSTALLATION - TEMP WALLS**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.

- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.
- E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs for temp doors. Use painted A-C plywood for barriers.

### **3.4 BLOCKING, NAILERS, AND SUPPORTS**

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- D. Provide the following specific non-structural framing and blocking:
  - 1. Door Frame system as required..

### **3.5 INSTALLATION OF CONSTRUCTION PANELS**

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
  - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
  - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
  - 3. Install adjacent boards without gaps.

### **3.6 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.

### **3.7 CLEANING, PROTECTION AND WATERTIGHTNESS**

- A. Conduct an inspection of the interior and exterior of the building and grounds, and submit a written report of any pre-existing leakage or damage, prior to performing any work.
- B. The Architect will conduct a similar inspection at the completion of the work, and the Contractor will be back-charged for all leakage or damage which was not documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Frequently clean up all refuse, rubbish, scrap materials and debris so the work site presents a neat, orderly and workmanlike appearance.

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- F. Carefully sweep areas of work to remove all residual debris upon the completion of all work. After cleaning the roof, thoroughly clean all drain sumps and drain lines, leader heads and leaders. Do not allow debris to enter the drain lines, leaders or underground drain lines

**END OF SECTION**

**SECTION 07 8400  
FIRESTOPPING**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 7000 - Execution: Cutting and patching.

**1.4 REFERENCE STANDARDS**

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
- B. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2013a.
- C. FM (AG) - FM Approval Guide; current edition.
- D. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- E. UL (FRD) - Fire Resistance Directory; current edition.
- F. UL 2079 - Standard Test Method of Fire Resistant Joints

**1.5 SUBMITTALS**

- A. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations.

**1.6 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the specified fire ratings when tested in accordance with methods indicated.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

**1.7 FIELD CONDITIONS**

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

**PART 2 PRODUCTS**

**2.1 FIRESTOPPING - GENERAL REQUIREMENTS**

- A. Mold and Mildew Resistance: Provide firestoppping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.
- C. Fire Ratings: Refer to drawings for required wall ratings.

## **2.2 FIRESTOPPING ASSEMBLY REQUIREMENTS**

- A. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

## **2.3 FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS**

- A. Gypsum Board Walls:
1. Wall to Wall Joints:
    - a. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
    - b. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
  2. Top of Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
    - a. 2 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
    - b. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
  3. Top of Wall Joints at Concrete Over Metal Deck:
    - a. 1 Hour Construction: UL System HW-D-0099; Specified Technologies Inc. SpeedFlex Joint Profile System.

## **2.4 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION**

- A. Penetrations Through Floors or Walls By:
1. Multiple Penetrations in Large Openings:
    - a. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  2. Uninsulated Metallic Pipe, Conduit, and Tubing:
    - a. 2 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
  3. Electrical Cables Not In Conduit:
    - a. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
  4. Insulated Pipes:
    - a. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX intumescent Firestop Sealant.
  5. HVAC Ducts, Uninsulated:
    - a. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE MAX Intumescent Firestop Sealant.
- B. Penetrations Through Walls By:
1. Uninsulated Metallic Pipe, Conduit, and Tubing:
    - a. 2 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - b. 1 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  2. Electrical Cables Not In Conduit:
    - a. 2 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  3. Insulated Pipes:
    - a. 2 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.

- b. 1 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
- 4. HVAC Ducts, Uninsulated:
  - a. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE MAX Intumescent Firestop Sealant or CP 606 Flexible Firestop Sealant.

## **2.5 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS**

### **2.6 MATERIALS**

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
  - 1. Manufacturers:
    - a. 3M Fire Protection Products; Product CP-25WB: [www.3m.com/firestop](http://www.3m.com/firestop).
    - b. 3M Fire Barrier Silicone Sealant 2000+
    - c. HILTI FS-ONE MAX ; [www.us.hilti.com](http://www.us.hilti.com)
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to the following:
  - 1. Density: 4 lb/cu ft.
  - 2. Manufacturers:
    - a. Thermafiber, Inc: [www.thermafiber.com](http://www.thermafiber.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

### **3.2 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

### **3.3 INSTALLATION**

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Install labeling required by code.

### **3.4 FIELD QUALITY CONTROL**

- A. Independent Testing Agency: Inspection agency employed and paid by Greenwich Public Schools, will examine penetration firestopping in accordance with ASTM E2174, 93Standard Practice for On-Site Inspection of Installed Fire Stops and ASTM E2393, 93Standard Practice for On-Site Inspection of Installed Fire Stop Joint Systems.
- B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

**3.5 CLEANING**

- A. Clean adjacent surfaces of firestopping materials.

**3.6 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

**SECTION 07 9200  
JOINT SEALANTS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint Sealants under all sills
- D. Joint backings and accessories.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 07 8400 - Firestopping: Firestopping sealants.
- C. Section 08 1116 - Aluminum Doors and Aluminum Frames.
- D. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.

**1.4 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 4. Substrates the product should not be used on.
  - 5. Substrates for which use of primer is required.
  - 6. Sample product warranty.
  - 7. Certification by manufacturer indicating that product complies with specification requirements.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five (5) years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Field Quality Control Plan:
  - 1. Visual inspection of entire length of sealant joints.

**1.6 MOCK-UP**

- A. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.
- B. Construct mock-up with specified sealant types and with other components noted.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

#### **1.7 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

### **PART 2 PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
  1. Dow Corning Corporation: [www.dowcorning.com/construction/#sle](http://www.dowcorning.com/construction/#sle).
  2. Sika Corporation: [www.usa-sika.com](http://www.usa-sika.com).
  3. W.R. Meadows, Inc: [www.wrmeadows.com/sle](http://www.wrmeadows.com/sle).
- B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
  1. Sika Corporation: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
  2. W.R. Meadows, Inc: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).

#### **2.2 JOINT SEALANT APPLICATIONS**

- A. Scope:
  1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.
    - b. Other joints indicated.
  2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.
    - b. Other joints indicated below.
  3. Do not seal the following types of joints.
    - a. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    - b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    - c. Joints where installation of sealant is specified in another section.
    - d. Joints between suspended panel ceilings/grid and walls.
- B. Vertical Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
- C. Interior Vertical Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
  1. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
- D. Sealant for Expansion Joints located at Door sills
  1. Use non sag sealant

## **2.3 JOINT SEALANTS - GENERAL**

- A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 6116.

## **2.4 NONSAG JOINT SEALANTS**

- A. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
  - 1. Color: varies.
  - 2. Applications: Use for:
    - a. Use for all perimeter joints of exterior applications around doors.. Color to be reviewed
    - b. Use under door sills. Color to be reviewed
  - 3. Manufacturers:
    - a. 786 Mildew Resistant; Dow Corning.
    - b. Sika Corporation; Sikasil GP: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
  - 4. Substitutions: 01 2500 - Substitution Procedures

## **2.5 SELF-LEVELING SEALANTS**

- A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
  - 1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
  - 2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: To be selected by Fuller and D'Angelo, P.C. from manufacturer's standard range.
  - 4. Service Temperature Range: Minus 40 to 180 degrees F.
  - 5. Manufacturers:
    - a. Sika Corporation; Sikaflex 1c SL: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
    - b. Use for all horizontal exterior joints and under saddles.
    - c. Substitutions: 01 2500 - Substitution Procedures

## **2.6 ACCESSORIES**

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
  - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
  - 2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
  - 3. Open Cell: 40 to 50 percent larger in diameter than joint width. (Not to be used in flat or horizontal joints)
  - 4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width. (Use for flat and horizontal joints)
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that joints are ready to receive work.

- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

### **3.2 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

### **3.3 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- H. Self-leveling joints: Recess joint depth as recommended by the sealant manufacturer.

### **3.4 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

**END OF SECTION**

**SECTION 09 2116  
GYPSUM BOARD ASSEMBLIES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Metal stud wall framing.
- B. Metal Trim
- C. Shaft Wall construction at corridor E panel
- D. Gypsum wallboard.
- E. Joint treatment and accessories.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

**1.4 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

**1.5 QUALITY ASSURANCE**

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
- B. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum \_\_\_ years of experience.

**PART 2 PRODUCTS**

**2.1 METAL FRAMING MATERIALS**

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
  - 1. Marino: [www.marinoware.com](http://www.marinoware.com).
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
  - 1. Studs: "C" shaped with flat or formed webs with knurled faces.
    - a. Minimum Base Metal Thickness: 0.0312 (20 gauge).
    - b. Depth: Match existing and as indicated on drawings
  - 2. Runners: U shaped, sized to match studs.
- C. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with specified performance requirements. Place around Electrical Panel infill wall per documents.
  - 1. Products:
    - a. Phillips Manufacturing Co; Hemmed H-Stud: [www.phillipsmfg.com/#sle](http://www.phillipsmfg.com/#sle). **2- 1/2" C-H STUDS 24" OC**

- D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.
- E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
  - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
  - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
- F. Non-Loadbearing Framing Accessories:
  - 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
  - 2. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

## 2.2 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
  - 1. Georgia-Pacific Gypsum: [www.gpgypsum.com](http://www.gpgypsum.com).
  - 2. USG Corporation: [www.usg.com](http://www.usg.com).
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  - 1. Application: Use for vertical surfaces, unless otherwise indicated.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    - a. Mold resistant board is required at all locations.
  - 3. Use Mold Resistant -Type X board, UL or WH listed.
  - 4. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
  - 5. Mold Resistant Paper Faced Products:
    - a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
    - b. USG Corporation: [www.usg.com](http://www.usg.com).
  - 6. Glass Mat Faced Products:

## 2.3 ACCESSORIES

- A. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
  - 1. Products:
    - a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: [www.titebond.com/#sle](http://www.titebond.com/#sle).
    - b. Substitutions: 01 2500 Substitution Procedures.
- B. Metal Edge Trim: Reveal Column, 6063T aluminum as manufactured by Fry Reglet Corporation.
  - 1. Model: Drywall DRWT, reveal joint WRM-75-75
  - 2. Size: 3/4" reveal width x 3/4" reveal depth x diameter as shown on drawings.
  - 3. Finish: Clear anodize aluminum.
- C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
  - 1. Corner Beads: Low profile, for 90 degree outside corners.
  - 2. L-Trim with Tear-Away Strip: Sized to fit 1/2 inch thick gypsum wallboard.
  - 3. Architectural Reveal Beads:
  - 4. Expansion Joints:

- a. Type: V-shaped PVC with tear away fins.
- D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
  - 1. Mold resistant and asbestos free.
  - 2. Products:
    - a. Continental Building Products: [www.continental-bp.com/#sle](http://www.continental-bp.com/#sle).
  - 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
    - a. Products:
      - a) CertainTeed Corporation; Extreme All-Purpose Joint Compound: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
- E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.

#### **3.2 FRAMING INSTALLATION**

- A. Metal Framing: Install in accordance with ASTM C754 .
- B. Provide metal bracing: at midpoint up to 8' 0"; at third point over 8'-0".
- C. Studs: Space studs at 16 inches on center unless shown otherwise
  - 1. Extend partition framing to structure in all locations.
  - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
  - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs minimum 16 gauge.
- E. Blocking: Install blocking for support of wall cabinets, wood frame openings, and hardware. Comply with Section 06 1000 for wood blocking.
- F. Suspended Ceiling and Soffits: Space framing and furring members as indicated.

#### **3.3 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  - 1. Place one bead continuously on substrate before installation of perimeter framing members.
  - 2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

#### **3.4 BOARD INSTALLATION**

- A. Comply with ASTM C 840.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

- C. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- D. Installation on Metal Framing: Use screws for attachment of gypsum board.

### **3.5 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
  - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

### **3.6 JOINT TREATMENT**

- A. Paper Faced Gypsum Board: Use fiberglass joint tape, embed with drying type joint compound and finish with drying type joint compound.
  - 1. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
  - 3. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
  - 5. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

### **3.7 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 9123  
INTERIOR PAINTING**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
  - 1. Gypsum Board/Plaster walls.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
  - 5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
  - 6. Marble, granite, slate, and other natural stones.
  - 7. Floors, unless specifically indicated.
  - 8. Ceramic and other tiles.
  - 9. Brick.
  - 10. Glass.
  - 11. Acoustical materials, unless specifically indicated.
  - 12. Concealed pipes, ducts, and conduits.

**1.3 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 2116 - Gypsum Board Assemblies.

**1.4 DEFINITIONS**

- A. Comply with ASTM D16 for interpretation of terms used in this section.

**1.5 REFERENCE STANDARDS**

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- E. SSPC-SP 1 - Solvent Cleaning; 2015.
- F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- G. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

## **1.6 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  - 2. MPI product number (e.g. MPI #47).
  - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
  - 4. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
  - 1. Where sheen is specified, submit samples in only that sheen.
  - 2. Where sheen is not specified, discuss sheen options with Fuller and D'Angelo, P.C. before preparing samples, to eliminate sheens definitely not required.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, and repair of painted and finished surfaces.
- G. Maintenance Materials: Furnish the following for Greenwich Public Schools's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
  - 3. Label each container with color in addition to the manufacturer's label.

## **1.7 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum 10 years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience.

## **1.8 MOCK-UP**

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Locate Owner's Representative
- C. Mock-up may remain as part of the work.

## **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

## **1.10 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
- B. Paints:
  - 1. Base Manufacturer: Sherwin-Williams Company: [www.sherwin-williams.com](http://www.sherwin-williams.com).
- C. Primer Sealers: Same manufacturer as top coats.

### **2.2 PAINTS AND FINISHES - GENERAL**

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
  - 1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at [www.paintinfo.com](http://www.paintinfo.com), for specified MPI categories, except as otherwise indicated.
  - 2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  - 3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  - 4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
  - 5. Supply each paint material in quantity required to complete entire project's work from a single production run.
  - 6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Fuller and D'Angelo, P.C. from the manufacturer's full line.
- E. Colors: Are to match existing unless otherwise indicated..
  - 1. In all areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

### **2.3 PAINT SYSTEMS - INTERIOR**

- A. Ferrous metals, Primed, Acrylic Latex, 2 coat:
  - 1. Touch up with latex primer.
  - 2. Two Coats Acrylic Latex spreading rate recommended by manufacturer to achieve a dry film thickness of 4 mils wet; 1.3 mils dry to 5.6 mils:
    - a. Sherwin Williams ProMar 400 Zero VOC Semi-Gloss
- B. Gypsum Board/Plaster, Latex, 3 coat: (New Surfaces)
  - 1. One Coat latex primer spreading rate recommended by manufacturer to achieve a dry film thickness of 4 mils wet and 1.3 mils dry.
    - a. Sherwin Williams QUICK DRY Interior Exterior Stain Blocking Primer Latex

2. Topcoat: Two Coats of Acrylic Latex spreading rate recommended by manufacturer to achieve a dry film thickness of 4 mils wet; 1.3 mils dry to 5.6 mils
  - a. Sherwin Williams ProMar 400 Zero VOC Semi-Gloss
- C. Gypsum Board/Plaster, Latex, 2 coat: (Existing Surfaces)
  1. One Coat latex primer spreading rate recommended by manufacturer to achieve a dry film thickness of 4 mils wet and 1.1 mils dry..
    - a. Sherwin Williams QUICK DRY Interior Exterior Stain Blocking Primer Latex
  2. Topcoat: One Coat of Latex spreading rate recommended by manufacturer to achieve a dry film thickness of 4 mils wet; 1.3 mils dry to 5.6 mils
    - a. Sherwin Williams ProMar 400 Zero VOC Semi-Gloss

## **2.4 ACCESSORY MATERIALS**

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  1. Gypsum Wallboard: 12 percent.
  2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

### **3.2 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
  1. Prior to removing mildew, test any cleaner on a small, inconspicuous area prior to use.
  2. Bleach and bleaching type cleaners may damage or discolor existing paint films. Alternative cleaning solutions may be required
  3. Wear protective eyewear, waterproof gloves, and protective clothing.
- F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Ferrous Metal:
  1. Solvent clean according to SSPC-SP 1.
  2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
  3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and SSPC-SP 3. Protect from corrosion until coated.

- H. Cleaning Existing Walls: Remove all loose paint, plaster and other coatings.
  - 1. Working from bottom to top, apply prepared cleaning solution to a dry surface.
  - 2. Leave solution on the surface for 5-20 minutes. If solution begins to dry, reapply.
  - 3. Gently scrub heavily soiled areas.
  - 4. Rinse thoroughly with clean water with by masonry washing equipment generating 400-1000 psi with a water flow rate of 6-8 gallons per minute delivered through a 15-45 degree fan spray tip.
  - 5. Apply after wash. Let the Afterwash stay on the surface for three to five minutes.
  - 6. Pressure rinse from the bottom of the treated area to the top.
- I. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- J. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### **3.3 APPLICATION**

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.4 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

### **3.5 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### **3.6 PROTECTION**

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

**END OF SECTION**

**SECTION 11 3100  
RESIDENTIAL APPLIANCES**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of each prime contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

**1.2 SECTION INCLUDES**

- A. Kitchen appliances.
- B. Dishwasher
- C. Refrigerator
- D. Laundry appliances.

**1.3 RELATED REQUIREMENTS**

- A. Section 22 1005 - Plumbing Piping: Plumbing connections for appliances.
- B. Section 26 2717 - Equipment Wiring: Electrical connections for appliances.

**1.4 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Greenwich Public Schools's name and registered with manufacturer.
- D. **CONTRACTOR IS EXPECTED TO HAVE ALL SUBMITTALS COMPLETED FOR APPLIANCES WITHIN 10 DAYS OF LETTER OF AWARD.**
- E. **UPON APPROVAL ALL APPLIANCES ARE TO BE ORDERED FOR DELIVERY WHERE FINAL COMPLETION CAN BE MET, PRIOR TO SCHOOL OPENING.**

**1.5 QUALITY ASSURANCE**

- A. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

**1.6 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
- D. Provide full lifetime, parts & labor manufacturer warranty on tub and door liner of dishwashers.

**PART 2 PRODUCTS**

**2.1 KITCHEN APPLIANCES**

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. All Equipment is to be from a single source and single manufacturer.
- C. Refrigerator, Type GE 21 CU FT GDE21EGKFS : Free-standing, bottom-mounted freezer, and frost-free.
  - 1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
  - 2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by DOE.
  - 3. Features: Include glass shelves, automatic icemaker, light in freezer compartment, and advanced water filtration.

4. Exterior Finish: Stainless steel, color as indicated.
5. Manufacturers:
  - a. GE Appliances; GDE 21 EGKWW : [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Range, Type GE 30" PHS930YPFS: Electric, free-standing, with sealed burners.
  1. Size: 30 inches wide.
  2. Oven: Self-cleaning with electronic ignition.
  3. Elements: Four (4). Induction cooktop Edge to Edge Ceramic Glass
  4. Controls: Solid state electronic.
  5. Features: Include automatic meat thermometer, oven door window, broiler pan and grid, and oven light.
  6. Exterior Finish: Stainless steel, color Stainless.
  7. Manufacturers:
    - a. GE Appliances; PHS930YPFS: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
- E. Cooking Exhaust, Type GE J VX5305SJSS: Range hood.
  1. Size: 30 inches wide.
  2. Fan: Two-speed, 270 cfm
  3. Exhaust: Rectangular, vented to exterior.
  4. Features: Include cooktop light and removable grease filter.
  5. Exterior Finish: Stainless steel, color Stainless steel to match other appliances.
  6. Manufacturers:
    - a. GE Appliances; J VX5305SJSS: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
- F. Microwave, Type JVM6175YKFS: Over-the-range.
  1. Capacity: 1.7 cubic ft.
  2. Power: 1000 watts.
  3. Features: Include turntable and 2-speed exhaust fan. Non-vented ductless model
  4. Exterior Finish: Stainless Steel to match other appliances.
  5. Manufacturers:
    - a. GE Appliances; JVM6175DKWW: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
- G. Dishwasher, Type GE GDF645SSNSS: Undercounter.
  1. Controls: Solid state electronic.
  2. Wash Levels: Three (3).
  3. Cycles: Six (6), including normal, rinse and hold, short, china/crystal, pot and pan, and sani-steam.
  4. Features: Include rinse aid dispenser, optional no-heat dry, optional water temperature boost, and adjustable upper rack.
  5. Finish: Stainless steel .
  6. Manufacturers:
    - a. GE Appliances; GDF645SGNWW: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).

## 2.2 LAUNDRY APPLIANCES

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Clothes Washer, Type GE GFW550SPNGD: Front-loading.
  1. Size: Full-size. 4.8 Cu Ft
  2. Controls: Solid state electronic.
  3. Cycles: Include normal, delicate, and soak.
  4. Motor Speed: Single-speed.

5. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, self-cleaning lint filter, sound insulation, and end of cycle signal. Microban, Sanitize with OXI
  6. Finish: Painted steel, color Diamond Grey.
  7. Manufacturers: GE
- C. Clothes Dryer, Type GE GFD55ESPNDG: Electric, stationary.
1. Size: Large capacity. 7.8 Cu Ft.
  2. Controls: Solid state electronic, with smart front load dryer.
  3. Temperature Selections: Four.
  4. Cycles: Include normal, permanent press, knit/delicate, and air only.
  5. Features: Include interior light, reversible door, sound insulation, and end of cycle signal.
  6. Finish: Painted steel, color Diamond Grey to match washer.
  7. Manufacturers: GE
- D. Substitutions: See Section 01 6000 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify utility rough-ins are provided and correctly located.

#### **3.2 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place and coordinate with cabinetry and countertops..

#### **3.3 ADJUSTING**

- A. Adjust equipment to provide efficient operation.

#### **3.4 CLEANING**

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.
- C. Provide dry run of all equipment to ensure proper functions.

**END OF SECTION**

**SECTION 12 3200**  
**PLASTIC LAMINATED CASEWORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Provide all plastic laminated casework and accessory items as specified herein. Refer to drawings for specific details, requirements, types and locations.
  - 1. All casework shall be plastic laminate, unless noted otherwise and shall include but not be limited to the following:
    - a. Base cabinets
    - b. Wall cabinets.
    - c. Sink Cabinets.
    - d. Shelf units.
    - e. Quartz Countertop and backsplash
    - f. Equipment to include:
      - a) Stainless steel ADA sink.
      - b) Plumbing fixtures and accessories.
    - g. Separate wood bases for laminated cabinets.
- B. Installation of all items specified herein, including sinks and sink covers.
  - 1. Service fittings, water and electrical shall be installed by the casework contractor. Final connection shall be made by the respective mechanical electrical contractor.

**1.3 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 06 1000 - Rough Carpentry for blocking within walls.+
- B. Section 09 2116 - Gypsum Board Assemblies for metal contour framing.
- C. Section 12 3600 - Countertops for counter tops.
- D. Fixture installation/services connections: Setting and installation of equipment and fixtures, and related utility connections, are provided under the other sections of the Project Specification governing that utility.
- E. Division 22 for Stainless steel sinks, fittings, traps, stops, tailpieces, vacuum breakers, electrical outlets and other fixtures, etc. Furnished and installed by plumbing contractor.
- F. Refer to Division 22 for mechanical runs connections.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: A single installer shall perform the work of this section, and shall be a firm with not less than ten (10) continuous years of successful experience in the installation of this work, similar to that required for this project and approved by the manufacturer..
  - 1. The installer shall provide a list of at least five projects of comparable size and similar in design within a fifty mile radius of this project, which may be observed by the representative of the Architect, and or Owner.
  - 2. Provide laminate clad casework and countertops furnished and installed by the same supplier for single responsibility and integration with other building trades.
- B. Manufacturer shall show evidence of a minimum of ten (10) years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project

- C. Casework must conform to design quality of materials, workmanship and function of casework specified and shown on drawings.
- D. ADA, Americans with Disabilities Act Requirements: The special requirements specified herein shall be met and shall be in compliance with Federal Register Volume 56, No. 144, Rules and Regulations.
- E. Design: Door/Drawer to set flush between cabinet end panels, flush inset design. Door/Drawer and all cabinet body edges to be 3mm PVC as specified herein. Overlay door designs and/or edging other than specified are not acceptable.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Preinstallation Conference: Conduct conference at Project site.

### 1.5 SUBMITTALS

- A. Samples:
  - 1. Submit 2-2" x 3" samples of casework manufacturer's standard decorative laminate colors, patterns and textures, for exposed and semi-exposed materials for architect's selection. Samples will be reviewed by Architect for color, texture, and pattern only. Compliance with other specified requirements is the exclusive responsibility of the contractor.
  - 2. Submit one full-size sample wall cabinet unit complete with hardware, doors, and adjustable shelves.
  - 3. Acceptable sample units will be used for comparison inspections at the project. Unless otherwise directed, acceptable sample units may be incorporated in the work. Notify architect of their exact locations. If not incorporated in the work, retain acceptable sample units in the building until completion and acceptance of the work.
  - 4. Remove sample units from the premises when directed by the Owner's Representative
  - 5. Quartz Countertop, 8 by 10 inches, for each type, color, pattern, and surface finish.
  - 6. Corner pieces as follows:
    - a. Cabinet front frame joints between stiles and rail, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
    - b. Miter joints for standing trim.
- B. Shop Drawings:
  - 1. Submit CAD production shop drawings prepared by manufacturer for laminate clad casework and countertops showing layout, elevations, ends, cross-sections, service run spaces, and location of services. Show details and location of all anchorages.
  - 2. Verify all dimensions and conditions in field.
  - 3. Include layout of units with relation to surrounding walls, doors, windows, and other building components.
  - 4. Indicate locations of hardware.
  - 5. Indicate locations and types of service fittings.
  - 6. Include details of utility spaces showing supports for conduits and piping.
  - 7. Coordinate shop drawings with other work involved.

### 1.6 PRODUCT HANDLING:

- A. Deliver laminate clad casework and countertops only after wet operations in building are completed.
- B. Store completed laminate clad casework and countertops in a ventilated place, protected from the weather, with relative humidity range of 20% to 50%.
- C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with a protective covering.

**1.7 JOB CONDITIONS:**

- A. Advise contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.

**1.8 WARRANTY:**

- A. All materials shall be guaranteed for a period of 5 years from manufacturer's defects and workmanship from date of acceptance.

**PART 2 - PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS:**

- A. Basis of Design: For purpose of determining minimum performance and quality standards, this specification is based upon drawings, specifications and manufacturer's literature fixed modular, flexible rail mounted, and mobile casework and accessories as manufactured by TMI SYSTEMS CORPORATION, 50 South Third Avenue West, Dickinson, North Dakota, 58601, Phone: 800-456-6716.
  - 1. Substitutions: Refer to Section 01 2500 - Substitution Procedures.
- B. Regardless of manufacturer or model numbers indicated, construction shall be in accordance with LSI Corporation of America Inc. and AWI Standard Specifications for modular cabinets except where modified by these specifications. Where standard manufacturers' units do not conform to layout and/or dimensions indicated, custom fabricate unit to conform to these specifications unless such non-conformance is specifically approved by the Architect.
  - 1. Submit proof of ability to provide Certificate of Compliance in AWI, Architectural Woodwork Institute Quality Certification Program, including QCP labels on finished goods.
- C. Substitutions: Refer to Section 01 2500 - Substitution Procedures.

**2.2 MATERIALS:**

- A. Core Materials:
  - 1. All core material shall be a blended bio fiber composition with ultra-low formaldehyde resin system. Board shall exceed performance requirements listed below. Testing for conformance to the listed specifications must be done in accordance with procedures described in the American National Standard for Particleboard (ANSI A208.1 2016 section 5.2 Sampling for Acceptance). Board shall comply with formaldehyde emission requirements for Particleboard in CPA-ECC-2011, ANSI A208.1 2016 and CCR 93120.2 (CARB Composite Wood ATCM Phase II) Casework manufacturer shall provide documentation and certification of use within the entire cabinet. No formaldehyde, no exceptions.
  - 2. Core material shall meet the following average performance requirements: Submit compliance data from the manufacturer prior to fabrication:
    - a. Density: Minimum 45 lbs.
    - b. Modulus of Rupture: 1,800 psi.
    - c. Modulus of Elasticity: 298,000 psi.
    - d. Average Internal Bond: 80 psi.
    - e. Screw holding Face: 2 225 lbs.
    - f. Screw holding Edge: 155 lbs.
    - g. Thickness Tolerance: 0.003+/- inches.
    - h. Linear expansion: 0.2%
    - i. Thickness swell: 5.5%
    - j. Thickness used are 1/4", 1/2", 3/4" and 1".
    - k. Plywood: Shall be 9-ply pressure treated hardwood plywood, "A" faced, hardwood veneer.
    - l. Provide moisture resistant core material at sink locations and wet areas:
      - a) Meeting ANSI MR10 minimum requirements, adding protection against occasional wetting and high humidity.

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B. Decorative Laminates:

1. High Pressure Decorative Laminates (HPDL) shall be as follows:
  - a. Horizontal Surfaces: (Countertops etc.)
    - a) 107HGS, matte finish, nominal thickness .048,±005 HIGH WEAR as manufactured by Wilsonart Brand Decorative Laminate
    - b) 10/HGS – High Pressure Grade .048 ±005 as manufactured by Formica Brand Laminate.
  - b. Exposed Casework Surfaces, Including Exposed Interior Surfaces:
    - a) 335VGS, matte finish, nominal thickness .028+0.001-0.004 as manufactured by Wilsonart Brand Decorative Laminate.
    - b) 335VGP, matte finish, nominal thickness .028+0.001-0.004 HIGH WEAR as manufactured by Wilsonart Brand Decorative Laminate.
    - c) 12/HGP High Pressure Grade (Standard grade) .028" as manufactured by Formica Brand Laminate.
  - c. Thermally Fused Laminate (TFL) meeting, NEMA Test LD 3-2005. (TFM allowed on casework interiors only, as specified below. Utilization of TFL on any exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.)
  - d. All laminate shall be counter balanced with heavy gauge neutral colored backing sheet.
2. Plastic laminate shall comply with the following minimum:

PHYSICAL PROPERTIES

PHYSICAL PROPERTIES	LD3 TEST	Type 107	Type 335
Appearance	3.1	No ABC Defects.	No ABC Defects
Light Resistance	3.3	Slight.	Slight
Cleanability	3.4	10.	10.
Stain Resistance	3.4		
Reagents 1 - 10		No Effect.	No Effect.
Reagents 11 - 15		Slight.	Slight.
Boiling Water Resistance	3.5	No Effect.	No Effect.
High Temperature Resistance	3.6	Slight.	No Effect.
Ball Impact Resistance - in	3.8	65	40".
Radiant Heat Resistance - sec	3.10	210 minimum.	200.
Dimensional Change	3.11		
Machine Direction -%		0.3	0.5
Cross Direction - %		0.7	0.8
Wear Resistance - cycles	3.13	400 (min.)	400 (min.)
Formability - inches		N/A	5/16".
Blistering -sec		N/A	45.
Weight:		0.322 psf.	0.186 psf
Fire Rating: ASTM E -84:			
As required by NYS Building Code		Flame spread 50	45.
		Smoke: 45	40.

3. Substitutions: Refer to Section 01 2500 - Substitution Procedures.
- C. Laminate Color Selection as indicated on drawings are as selected by the Architect. Final acceptance of colors by other manufacturer(s) even if listed, as "acceptable manufactures" shall be at the sole discretion of the Architect.
- D. Edgebanding: 3mm PVC banding, machine applied with waterproof hot melt adhesive with external edges and outside corners of door machine profiled to 1/8" radius for safety.

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- E. Metal Parts: Countertop support brackets, legs and miscellaneous metal parts shall be furniture steel, welded, degreased, cleaned, treated and epoxy powder coated in color selected by the Architect.

### 2.3 CABINET HARDWARE:

- A. Hinges:
1. Shall be five knuckle, institutional grade, 2 3/4" overlay type with hospital tip, eased edges for safety, and a full, 270° door swing for easy access. Steel shall be minimum .095" thick and have minimum of nine (9) edge and leaf fastenings. Hinges shall pass ANSI-BHMA standard A156.9, Grade 1 requirement for both vertical and horizontal set and sag (pair of hinges will hold minimum of 310 pounds); copy of test result shall be provided upon request. Casework manufacturer shall use nine specifically engineered screws for attachment of hinges; wood screws shall not be permitted. Doors 48" and over in height shall have three (3) hinges per door.
  2. Color: As selected by the Architect,
  3. Provide magnetic door catch with minimum seven (7) pound pull, attached with screws and slotted for adjustment.
- B. Pulls:
1. Door and drawer front pull shall be ABS plastic, semi recessed, designed of molded plastic and a large gripping space, impact resistance, and no sharp edges. Pull design shall be compatible with Americans with Disability Act (ADA), Federal Register Volume 56, No. 144, specifically paragraph 4.27.4. Other pulls may be acceptable pending architect approval.
    - a. Color: As selected by the Architect
- C. Drawer Slides:
1. Standard use and knee space drawers shall be Accuride 3600 series or equal with epoxy finish. Slides will have a 150 pound load rating at **full extension** and a built-in, positive stop both directions, with self closing feature. Slides shall have a lifetime warranty as offered by the slide manufacturer.
    - a. File drawer slides shall be full extension. Slides shall have a lifetime warranty as offered by the slide manufacturer.
- D. Shelf Supports:
1. Adjustable Shelf Supports: Twin pin design with anti tip-up shelf restraints for both 3/4 inch (19.1 mm) and 1 inch (25.4 mm) shelves. Design shall include slot for ability to mechanically attach shelf to clip. Load rating shall be minimum 300 lbs. (136 kg) each support without failure. Cabinet interior sides shall be flush, without shelf system permanent projection.
- E. Under Counter Support Legs:
1. Chrome plated steel round support legs with adjustable feet and steel mounting plate.
    - a. Model: #635.68.271.
    - b. Manufacturer: Hafle of America 1-800-423-3531.

### 2.4 ADA AMERICANS WITH DISABILITIES ACT REQUIREMENTS:

- A. The following special requirements shall be met, where specifically indicated on architectural plans as "ADA" or by General Note. To be in compliance with Federal Register Volume 56, No. 144, Rules and Regulations:
1. Countertop height: with or without cabinet below not to exceed a height of 34 inches A.F.F. (Above Finished Floor), at a surface depth of 24 inches.
    - a. Knee space clearance: to be a minimum 27 inches A.F.F., and 30 inches clear span width.
    - b. 12 inch deep shelving, adjustable or fixed: not to exceed a range from 9 inches A.F.F. to 54 inches A.F.F.
    - c. Wardrobe cabinets: to be furnished with rod/shelf adjustable to 48 inches A.F.F., and a maximum 21 inch shelf depth.

- d. Sink cabinet clearances: in addition to above, upper knee space frontal depth to be no less than 8 inches, and lower toe frontal depth to be no less than 11 inches, at a point 9 inches A.F.F. and as further described in Volume 56, Section 4.19.
- e. No cabinets shall be install closer than 18" to the pull side of any door. Co-ordinate with electrical drawings for electrical devices.

## 2.5 QUARTZ COUNTERTOPS

- A. Natural quartz and Resin Composite Countertops as manufactured by Wilsonart
- B. Size as shown on drawings.
  - 1. Provide for countertop of Life Skills Room and related work, coordinate fastenings with cabinetry:  
**SEE SECTION 12 3600**

## 2.6 STAINLESS STEEL SINKS

- A. Refer to Division 22 Plumbing for furnishing and installing stainless steel sinks.
- B. Sink 1 ADA Compliance
  - 1. Seamless die-drawn construction of 16 gauge type 316 stainless steel.
  - 2. Size: 19-1/4" D x 18-1/4" W x 5-1/2".
  - 3. Three (3) holes at 4" oc.
  - 4. Interior and top surfaces polished to a non-porous Hand Blended Just Finish.
  - 5. Fully coated underside.
  - 6. Straight sided compartment with 1-3/4" radius corners.
  - 7. Self-rimming top mount with Grip-Rim Plus with stainless steel mounting channels.
  - 8. Drain punched for Just J-35-SSF drain.
  - 9. NSF Certified.
  - 10. Product: SL-ADA-2019-16-GR, Just Manufacturing Company; custserv@justmfg.com
- C. Sink #2
  - 1. Seamless die-drawn construction of 16 gauge type 316 stainless steel.
  - 2. Size: 19-1/4" D x 18-1/4" W x 7-1/2".
  - 3. Three (3) holes at 4" oc.
  - 4. Interior and top surfaces polished to a non-porous Hand Blended Just Finish.
  - 5. Fully coated underside.
  - 6. Straight sided compartment with 1-3/4" radius corners.
  - 7. Self-rimming top mount with Grip-Rim Plus with stainless steel mounting channels.
  - 8. Drain punched for Just J-35-SSF drain.
  - 9. NSf Certified.
  - 10. Product: Model SL-2019-16-GR, Just Manufacturing Company; custserv@justmfg.com

## 2.7 FABRICATION

- A. Casework
  - 1. Detailed Requirements for Cabinet Construction:
    - a. Sub-Base: Cabinet Subbase: To be separate and continuous (no cabinet body sides-to-floor), water-resistant exterior grade plywood with concealed fastening to cabinet bottom. Ladder-type construction, of front, back and intermediates, to form a secure and level platform to which cabinets attach.
    - b. Sub-base at exposed cabinet end panels shall be recessed 1/4 inch (6.4 mm) from face of finished end, for flush installation of finished base material by other trades.
  - 2. Fabricate casework to dimensions, profiles, and details shown.
    - a. Cabinet Body Construction:
      - a) Solid sub-top shall be furnished for all base and tall cabinets.

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- b) At cabinets over 36 inches (914 mm), bottoms and tops shall be mechanically joined by a fixed divider.
- c) Exterior exposed wall cabinet bottoms shall be white pressure fused laminate both sides. Assembly devices shall be concealed on bottom side of wall cabinets
- d) Tops and bottoms shall be joined to cabinet ends and internal cabinet components such as fixed horizontals, rails and verticals shall be joined using 10mm diameter industrial grade hardwood dowels, laterally fluted with chamfered ends, securely glued and clamped under pressure during assembly to secure joints and cabinet squareness. Use minimum of six (6) dowels at each joint for 24" deep cabinets and minimum of four (4) dowels at each joint for 12" deep cabinets.
- e) Unless specifically indicated, core shall be 3/4" thick particleboard. Edging and surface finishes as indicated herein.
- f) Cabinet back shall be fully bound (dadoed) into sides, top, and bottom, recessed 7/8 inch (22.2 mm) from cabinet rear. Rear, unexposed, side of back shall be toe-nailed to cabinet body with mechanical fasteners and solidified with a continuous bead of industrial grade hot melt adhesive
  - (a) Exposed back on fixed or movable cabinets to be 3/4" particleboard, color matched to cabinet interior, exterior surface GP28 laminate as selected.
  - (b) Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide minimum of 2 at base, 2 at wall, and 3 at tall cabinets.
- g) All fixed under counter and tall units shall have separate factory applied or field constructed base, constructed of 3/4" moisture resistant plywood. Base shall be 96mm (nominal 4") high unless otherwise indicated on the drawings.
- h) All under counter units except sink base units, shall be provided with full sub top. Sink base units shall be provided with open top, front welded steel/epoxy painted sink rail full width at top front edge concealed behind face rail/doors, split back removable access panels and bottom panel to have CL20 high pressure cabinet liner both faces, color to match interior color. No exceptions will be permitted.
- i) All end panels and vertical dividers, except sink base units, shall be prepared to receive adjustable shelf hardware at 32mm (approximately 1-1/4") centers. Door hinges, drawer slides and pull-out shelves shall mount on line boring to maintain vertical alignment of components and provide for future relocation of doors, drawers, shelves and/or pull-out shelves.
- j) All exposed and semi exposed edges of basic cabinet components shall be factory edged with 3 mm PVC banding, machine applied with waterproof hot melt adhesive. Color as selected by the Architect.
- k) Adjustable shelf core shall be 3/4" thick particleboard up to 30" wide, 1" thick particleboard over 30" wide.
  - (a) Front edge shall have factory applied 3 mm PVC, color to match shelf color.
- l) Interior Finish, Units with Open Interiors:
  - (a) Sides, top, bottom, horizontal, and vertical members, and adjustable shelving faced high pressure plastic laminate with matching back.
- m) Interior Finish, Units with Closed interiors:
  - (a) Sides, top, bottom, horizontal, and vertical members, and adjustable shelving faced with melamine laminate with matching prefinished back in color as selected by the Architect.
- n) Exposed Ends:
  - (a) Shall be faced with high pressure decorative laminate GP28 (.028) color from casework manufacturer's full range offering of at least 120 colors.
- o) Wall Unit Bottom:

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- (a) Shall be faced with melamine laminate in color as selected by the Architect.
    - p) Wall and Tall Unit Tops:
      - (a) The top edge of all wall and tall unit end panels shall be factory edged with 3mm PVC to match basic cabinet body color; raw edges at top of wall and tall end panels will not be permitted.
        - (1) Top surface will be laminated with melamine in color as selected by the Architect.
    - b. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), will not be permitted. No exceptions.
  - 3. Drawers:
    - a. Sides, back and sub front shall be particleboard, 1/2" thick, laminated with melamine in dove gray, frosty white or light beige to match basic cabinet body color. The back and sub front are doweled and glued into the sides. Dowels shall be fluted, with chamfered ends and a minimum diameter of 8 mm. Top edges is banded with 3 mm PVC edging in a matching color.
      - a) Drawer bottom shall be particleboard, 1/2" thick, laminated with melamine in color to match basic cabinet body color, screwed directly to the bottom edges of the drawer box. Drawer bottom less than 1/2" thick will not be permitted.
      - b) Paper storage drawers are constructed similar except retaining hood shall be included at the rear of each drawer.
      - c) Painted finishes on drawer sides and/or bottom will not be permitted.
  - 4. Door/Drawer Fronts:
    - a. Laminated door and drawer fronts shall be 13/16 inch (20.6 mm) thick for all hinged and sliding doors. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8 inch (3.2 mm) reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet.
  - 5. Double doors shall be used on all cabinets in excess of 24" wide.
  - 6. Exterior faces shall be laminated with high pressure decorative laminate specified, color as selected. Interior face shall be high pressure cabinet liner CL20.
  - 7. All edges shall be finished with 3mm PVC available in color as selected by the Architect. External edges and outside corners shall be machine profiled to 1/8" radius.
- B. Door/Drawer Front Rail: Provide minimum 3/4 inch (19.1 mm) x 6 inch (152 mm) x full width cabinet body rails immediately behind all door/drawer and multiple drawer horizontal joints to maintain exact body dimensions, close off reveal, and be locator for lock strikes.

## 2.8 WORKMANSHIP:

- A. All exposed exterior cabinet surfaces to be decorative high pressure plastic laminate, color as selected by the Architect. Laminate surface/backer to core under controlled conditions, by approved and regulated laminating methods to assure a premium lamination. Natural-setting P.V.A. Type III water resistant adhesives that cure through chemical reaction, containing no health or environmentally hazardous ingredients, are required. Methods requiring heat are not allowed: "contact" , methods of laminating are not allowed.
  - 1. Cabinet parts shall be accurately machined and bored for premium grade quality joinery construction utilizing automatic machinery to insure consistent sizing of modular components. End panels shall be doweled to receive bottom and top.
  - 2. Back panel to be housed per AWI Standards using concealed dado or dowel matched or interlocking mechanical fasteners. Concealed dado and dowel methods shall be assembled utilizing glue and pressure. Dado method must be reinforced with blind nailing or screwing.
  - 3. Drawer bottom shall be fully housed into sides, back and sub front. Sides of drawer shall be fully dadoed to receive drawer back, locked in fully to sub-front, fastened with glue and mechanical

fasteners. Recessed construction methods to utilize blind nailing hang rails as required per AWI specifications.

4. 3/4 inch thick hang rails shall be glued to backside and mechanically fastened to end panels of all wall, base and tall cabinets for extra rigidity and to facilitate installation.
5. Rear of cabinet back and underside of drawer bottom joints to receive a continuous bead of hot melt adhesive to add to unit body strength and develop moisture and vermin seal.
6. All cases shall be square, plumb, and true.
7. Case body and drawer workmanship and quality of construction shall be further evidenced by Independent Testing Laboratory results as described in 1.04 D.
8. Provide removable back panels and closure panels for plumbing access where shown on drawings.

## **2.9 ACCESS PANELS:**

- A. Provide removal full width, back panels and closure panels with tamper proof screws cam lock for access to heating and/or plumbing valves, traps, etc. as required. Coordinate with mechanical/electrical drawings.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION:**

- A. The installer must examine the jobsite and the conditions under which the work under this section is to be performed, and notify the contractor in writing of unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

### **3.2 PREPARATION:**

- A. Condition laminate clad casework to average prevailing humidity conditions in installation areas prior to installing.

### **3.3 COORDINATION:**

- A. Verify site dimensions of cabinet locations in building prior to fabrication
- B. Coordinate layout and installation of framing and reinforcements for support of casework, and equipment furnished by others and installed in casework..
- C. Coordinate installation of roughing with other prime contractors.
- D. Coordinate layout and installation of framing and reinforcements for support of casework.
- E. Coordinate installation of casework with installation of other casework equipments and accessories.

### **3.4 PROTECTION**

- A. Storage and Protection: Casework shall be protected in storage. Store under cover in a ventilated building not exposed to extreme temperature and humidity changes. Store off the floor to prevent chipping of laminate. Do not store or install casework in building until concrete, masonry or other wet trades are dry.

### **3.5 INSTALLATION OF CABINETS**

- A. Install all base cabinets on a separate wood base.
- B. Install insulation to rear of cabinets as detailed.
- C. Install level, plumb, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
  1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
  2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
  3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
  4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
  5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

6. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
    - a. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than 2 fasteners per side.
  7. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches o.c.
  8. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
  9. Adjust casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
- D. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- E. All fasteners shall be approved by the architect and provide with screw caps or approved washers. Gypsum board screws are not permitted.

### 3.6 INSTALLATION OF COUNTERTOPS

- A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.
1. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Prepare edges in shop for field-made joints.
    - a. Use concealed clamping devices for field-made joints in plastic-laminate countertops. Locate clamping devices within 6 inches of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.
  2. Fastening:
    - a. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
    - b. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
      - a) Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
  3. Provide required holes and cutouts for sinks and service fittings.
    - a. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
    - b. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
    - c. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- C. Seal joint between back/end splashes and vertical surfaces.

### 3.7 INSTALLATION OF STAINLESS STEEL SINKS

- A. Comply with requirements in Division 22 for installing sink, water, drainage, faucets and fittings.
1. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings

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in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

**3.8 ADJUSTING**

- A. Repair or remove and replace defective work, as directed by (Architect/Owner) upon completion of installation.
- B. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly.

**3.9 CLEANING AND PROTECTION:**

- A. Repair or remove and replace defective work as directed upon completion of installation.
  - 1. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts or units.
  - 2. Remove all cartons, debris, sawdust, scraps, etc. and leave space ready for final cleaning.
  - 3. Protect all casework and tops from damage by other trades until acceptance of the work by the Owner.

**END OF SECTION**

**SECTION 12 3600  
COUNTERTOPS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Countertops for manufactured casework.
- B. Sinks undermounted into countertops.

**1.2 RELATED REQUIREMENTS**

- A. Section 12-3200 Plastic Laminated Casework

**1.3 REFERENCE STANDARDS**

- A. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- B. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

**1.4 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- C. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- D. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- E. Installer's qualification statement.

**1.5 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Natural Stone Institute (NSI) Accredited Natural Stone Fabricator; [www.naturalstoneinstitute.org/#sle](http://www.naturalstoneinstitute.org/#sle).

**PART 2 PRODUCTS**

**2.1 COUNTERTOP ASSEMBLIES**

- A. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate. Manufacturer: Wilsonart Quartz
  - 1. Flat Sheet Thickness: 1-1/4 inch, minimum.
  - 2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    - a. Manufacturers:
      - a) Wilsonart; QUARTZ: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
    - b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
    - c. Finish on Exposed Surfaces: Polished.
  - 3. Wall Panels: 1/2 inch, and 3/4 inch thick.
  - 4. Other Components Thickness: 3/4 inch, minimum.
  - 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
  - 6. Fabricate in accordance with manufacturer's standard requirements.

**2.2 FABRICATION**

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using best method recommended by manufacturer.

2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
  3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
  2. Height: 4 inches, unless otherwise indicated.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Fuller and D'Angelo, P.C. of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.3 INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.

#### **3.4 TOLERANCES**

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

#### **3.5 CLEANING**

#### **3.6 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**

SECTION 221116  
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included: Provide Domestic water piping in accordance with the Contract Documents.” The “General Conditions Governing All Contracts” shall apply to all work under the contract. The work of this section shall include, but not be limited to, the following:
- B. Section Includes:
  - 1. Aboveground domestic water pipes, tubes, fittings, and specialties inside the building.

1.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Domestic water piping and support and installation shall withstand effects of earthquake motions determined according to ASCE/SEI 7.

1.3 SUBMITTALS

- A. Product Data: For the following products:
  - 1. Specialty valves.
  - 2. Transition fittings.
  - 3. Dielectric fittings.
  - 4. Flexible connectors.
  - 5. Escutcheons.
  - 6. Sleeves and sleeve seals.
  - 7. Water penetration systems.
- B. Coordination Drawings: For piping in equipment rooms and other congested areas, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
  - 1. Domestic water piping.
- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.5 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

## PART 2 - PRODUCTS

### 2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

### 2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B) water tube, drawn temper.
  - 1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.
  - 2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
  - 3. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
  - 4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
  - 5. Copper Pressure-Seal-Joint Fittings:
    - a. 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:
      - 1) Elkhart Products Corporation; Industrial Division.
      - 2) NIBCO INC.
      - 3) Viega; Plumbing and Heating Systems.
    - b. NPS 2 (DN 50) and Smaller: Wrought-copper fitting with EPDM-rubber O-ring seal in each end.
    - c. NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Cast-bronze or wrought-copper fitting with EPDM-rubber O-ring seal in each end.
  - 6. Copper-Tube Extruded-Tee Connections:
    - a. 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:
      - 1) T-DRILL Industries Inc.
    - b. Description: Tee formed in copper tube according to ASTM F 2104.

### 2.3 PIPING JOINING MATERIALS

- A. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

### 2.4 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

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B. Dielectric Unions:

1. 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 or approved equal:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. EPCO Sales, Inc.
  - d. Hart Industries International, Inc.
  - e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - f. Zurn Plumbing Products Group; Wilkins Water Control Products.
2. Description:
  - a. Pressure Rating: 150 psig (1035 kPa) at 180 deg F (82 deg C).
  - b. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

1. 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 or approved equal:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. EPCO Sales, Inc.
  - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
  - a. Factory-fabricated, bolted, companion-flange assembly.
  - b. Pressure Rating: 175 psig (1200 kPa) minimum.
  - c. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric Couplings:

1. 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 or approved equal:
  - a. Calpico, Inc.
  - b. Lochinvar Corporation.
2. Description:
  - a. Galvanized-steel coupling.
  - b. Pressure Rating: 300 psig (2070 kPa) at 225 deg F (107 deg C).
  - c. End Connections: Female threaded.
  - d. Lining: Inert and noncorrosive, thermoplastic.

E. Dielectric Nipples:

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1. 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 or approved equal:
  - a. Perfection Corporation; a subsidiary of American Meter Company.
  - b. Precision Plumbing Products, Inc.
  - c. Victaulic Company.
2. Description:
  - a. Electroplated steel nipple complying with ASTM F 1545.
  - b. Pressure Rating: 300 psig (2070 kPa) at 225 deg F (107 deg C).
  - c. End Connections: Male threaded or grooved.
  - d. Lining: Inert and noncorrosive, propylene.

2.5 ESCUTCHEONS

- A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.
- B. One Piece, Cast Brass: Polished, chrome-plated or rough-brass finish with setscrews.
- C. One Piece, Deep Pattern: Deep-drawn, box-shaped brass with chrome-plated finish.
- D. One Piece, Stamped Steel: Chrome-plated finish with setscrew or spring clips.
- E. Split Casting, Cast Brass: Polished, chrome-plated or rough-brass finish with concealed hinge and setscrew.
- F. Split Plate, Stamped Steel: Chrome-plated finish with concealed hinge, setscrew or spring clips.
- G. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- H. Split-Casting Floor Plates: Cast brass with concealed hinge.

2.6 SLEEVES

- A. Cast-Iron Wall Pipes: Fabricated of cast iron, and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.
- C. Molded-PE Sleeves: Reusable, PE, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- D. Molded-PVC Sleeves: Permanent, with nailing flange for attaching to wooden forms.
- E. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- F. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc-coated, with plain ends.

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- G. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with setscrews.

2.7 SLEEVE SEALS

- A. 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 or approved equal:

1. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex, Inc.
4. Pipeline Seal and Insulator, Inc.

- B. Description: Modular sealing element unit, designed for field assembly, used to fill annular space between pipe and sleeve.

1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Stainless steel.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install shutoff valve immediately upstream of each dielectric fitting.
- C. Install domestic water piping level and plumb.
- D. Install seismic restraints on piping.
- E. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- F. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- G. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- H. Install piping adjacent to equipment and specialties to allow service and maintenance.
- I. Install piping to permit valve servicing.

- J. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
- K. Install piping free of sags and bends.
- L. Install fittings for changes in direction and branch connections.
- M. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

### 3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" Chapter.
- E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- F. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- G. Ductile-Iron-Piping Grooved Joints: Cut groove end of pipe. Assemble coupling with housing, gasket, lubricant, and bolts. Join ductile-iron pipe and grooved-end fittings according to AWWA C606 for ductile-iron-pipe, cut-grooved joints.
- H. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- I. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

### 3.3 VALVE INSTALLATION

- A. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 (DN 50) and smaller. Use butterfly or gate valves for piping NPS 2-1/2 (DN 65) and larger.

### 3.4 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.

- B. Transition Fittings in Aboveground Domestic Water Piping NPS 2 (DN 50) and Smaller: Plastic-to-metal transition fittings or unions.

### 3.5 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 (DN 50 and Smaller): Use dielectric unions.
- C. Dielectric Fittings for NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Use dielectric flanges.

### 3.6 HANGER AND SUPPORT INSTALLATION

- A. Hangers and Supports for Plumbing Piping and Equipment.
  - 1. Vertical Piping: MSS Type 8 or 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet (30 m) If Indicated: MSS Type 49, spring cushion rolls.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support vertical piping and tubing at base and at each floor.
- C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch (10 mm).
- D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
  - 3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
- E. Install supports for vertical copper tubing every 10 feet (3 m).
- F. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/4 (DN 32) and Smaller: 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
  - 3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
- G. Install supports for vertical steel piping every 15 feet (4.5 m).
- H. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

### 3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
  - 1. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 (DN 65) and larger.

### 3.8 ESCUTCHEON INSTALLATION

- A. Install escutcheons for penetrations of walls, ceilings, and floors.
- B. Escutcheons for New Piping:
  - 1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
  - 2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish.
  - 3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish.
  - 4. Bare Piping in Unfinished Service Spaces: One piece, cast brass with rough-brass finish.
  - 5. Bare Piping in Equipment Rooms: One piece, cast brass.
  - 6. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

### 3.9 SLEEVE INSTALLATION

- A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.
- B. Sleeves are not required for core-drilled holes.
- C. Permanent sleeves are not required for holes formed by removable PE sleeves.
- D. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.
- E. Install sleeves in new partitions, slabs, and walls as they are built.
- F. For interior wall penetrations, seal annular space between sleeve and pipe or pipe insulation using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants" for joint sealants.
- G. Seal space outside of sleeves in concrete slabs and walls with grout.
- H. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation unless otherwise indicated.
- I. Install sleeve materials according to the following applications:

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1. Sleeves for Piping Passing through Concrete Floor Slabs: Steel pipe.
  2. Sleeves for Piping Passing through Concrete Floor Slabs of Mechanical Equipment Areas or Other Wet Areas: Steel pipe.
    - a. Extend sleeves 2 inches (50 mm) above finished floor level.
    - b. For pipes penetrating floors with membrane waterproofing, extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches (50 mm) above finished floor level.
  3. Sleeves for Piping Passing through Gypsum-Board Partitions:
    - a. PVC pipe sleeves for pipes smaller than NPS 6 (DN 150).
    - b. Galvanized-steel sheet sleeves for pipes NPS 6 (DN 150) and larger.
    - c. Exception: Sleeves are not required for water supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.
  4. Sleeves for Piping Passing through Interior Concrete Walls:
    - a. Steel pipe sleeves for pipes smaller than NPS 6 (DN 150).
- J. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 7 Section "Penetration Firestopping" for firestop materials and installations.

3.10 SLEEVE SEAL INSTALLATION

- A. Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble sleeve seal components and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.11 IDENTIFICATION

- A. Identify system components. Comply with requirements in Division 15 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.
- B. Label pressure piping with system operating pressure.

3.12 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Piping Inspections:
1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by the State of Connecticut.
  2. During installation, notify the Greenwich public schools at least one day before inspection must be made. Perform tests specified below in presence of the field contractor:
    - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    - b. Final Inspection: Arrange final inspection for the State of Connecticut to observe tests specified below and to ensure compliance with requirements.

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3. Reinspection: If the State of Connecticut find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by the Greenwich public schools .

C. Piping Tests:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and for corrective action required.

D. Domestic water piping will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.13 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
4. Remove and clean strainer screens. Close drain valves and replace drain plugs.
5. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.14 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Aboveground domestic water piping, NPS 2 (DN 50) and smaller, shall be one of the following:
  1. Hard copper tube, ASTM B 88, Type L (ASTM B 88M, Type B); cast- or wrought- copper solder-joint fittings; and soldered joints.
  2. Hard copper tube, ASTM B 88, Type L (ASTM B 88M, Type B); copper pressure-seal-joint fittings; and pressure-sealed joints.
  3. Hard copper tube, ASTM B 88, Type L (ASTM B 88M, Type B); copper push-on-joint fittings; and push-on joints.

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3.15 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 (DN 50) and smaller.
  - 2. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION

SECTION 221316

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following for soil, waste, and vent piping inside the building:
  - 1. Pipe, tube, and fittings.
  - 2. Special pipe fittings.
  - 3. Encasement for underground metal piping.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.
- C. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
  - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be capable of withstanding the effects of seismic events determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Shop Drawings:
  - 1. Design Calculations: Signed and sealed by a qualified professional engineer for selecting seismic restraints.

- C. Field quality-control inspection and test reports.

## 1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

### 2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

### 2.3 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class(es).
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

### 2.4 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Sovent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
- C. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
  - 1. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.
    - a. Available Manufacturers:
      - 1) ANACO.
      - 2) Fernco, Inc.
      - 3) Ideal Div.; Stant Corp.

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- 4) Mission Rubber Co.
  - 5) Tyler Pipe; Soil Pipe Div.
2. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.
  - a. Available Manufacturers:
    - 1) ANACO.
    - 2) Clamp-All Corp.
    - 3) Ideal Div.; Stant Corp.
    - 4) Mission Rubber Co.
    - 5) Tyler Pipe; Soil Pipe Div.
3. Heavy-Duty, Shielded, Cast-Iron Couplings: ASTM A 48/A 48M, two-piece, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve.
  - a. Available Manufacturers:
    - 1) MG Piping Products Co.

## 2.5 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Standard Weight or Schedule 40, galvanized. Include ends matching joining method.
- B. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.
- C. Pressure Fittings:
  1. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized, seamless steel pipe. Include ends matching joining method.
  2. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
  3. Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
  4. Cast-Iron Flanges: ASME B16.1, Class 125.
  5. Cast-Iron, Flanged Fittings: ASME B16.1, Class 125, galvanized.
- D. Grooved-Joint Systems:
  1. Available Manufacturers:
    - a. Anvil International.
    - b. Star Pipe Products; Star Fittings Div.
    - c. Victaulic Company.
    - d. Ward Manufacturing, Inc.
  2. Grooved-End, Steel-Piping Fittings: ASTM A 47/A 47M, galvanized, malleable-iron casting; ASTM A 106, galvanized-steel pipe; or ASTM A 536, galvanized, ductile-iron casting; with dimensions matching steel pipe.
  3. Grooved-End, Steel-Piping Couplings: AWWA C606, for steel-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.

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2.6 STAINLESS-STEEL PIPE AND FITTINGS

- A. Pipe and Fittings: ASME A112.3.1, drainage pattern with socket and spigot ends.
- B. Gaskets: Lip seals shaped to fit socket groove, with plastic backup ring.
  - 1. Material: EPDM, unless NBR is indicated.

2.7 DUCTILE-IRON PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end, unless grooved or flanged ends are indicated.
  - 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  - 2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end, unless grooved or flanged ends are indicated.
  - 1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  - 2. Gaskets: AWWA C111, rubber.
- C. Grooved-Joint Systems:
  - 1. Available Manufacturers:
    - a. Victaulic Company.
  - 2. Grooved-End, Ductile-Iron Fittings: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions matching pipe.
  - 3. Grooved-End, Ductile-Iron-Piping Couplings: AWWA C606, for ductile-iron-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.
- D. Flanges: ASME 16.1, Class 125, cast iron.

2.8 SPECIAL PIPE FITTINGS

- A. Flexible, Nonpressure Pipe Couplings: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear ring, ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
  - 1. Available Manufacturers:
    - a. Dallas Specialty & Mfg. Co.
    - b. Fernco, Inc.
    - c. Logan Clay Products Company (The).
    - d. Mission Rubber Co.
    - e. NDS, Inc.

- f. Plastic Oddities, Inc.
- 2. Sleeve Materials:
  - a. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
  - b. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
  - c. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- B. Shielded Nonpressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
  - 1. Available Manufacturers:
    - a. Cascade Waterworks Mfg. Co.
    - b. Mission Rubber Co.
- C. Expansion Joints: Two or three-piece, ductile-iron assembly consisting of telescoping sleeve(s) with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
  - 1. Available Manufacturers:
    - a. EBAA Iron Sales, Inc.
    - b. Romac Industries, Inc.
    - c. Star Pipe Products; Star Fittings Div.
- D. Wall-Penetration Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
  - 1. Available Manufacturers:
    - a. SIGMA Corp.

## 2.9 PIPING APPLICATIONS

- A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
  - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  - 2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.
  - 3. Steel pipe, drainage fittings, and threaded joints.
  - 4. Stainless-steel pipe and fittings, gaskets, and gasketed joints.
  - 5. Copper DWV tube, copper drainage fittings, and soldered joints.
- C. Aboveground, vent piping NPS 4 and smaller shall be any of the following:

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1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.
3. Steel pipe, drainage fittings, and threaded joints.
4. Stainless-steel pipe and fittings gaskets, and gasketed joints.
5. Copper DWV tube, copper drainage fittings, and soldered joints.
  - a. Option for Vent Piping, NPS 2-1/2 and NPS 3-1/2: Hard copper tube, Type M; copper pressure fittings; and soldered joints.
6. Dissimilar Pipe-Material Couplings: Flexible, Shielded, nonpressure pipe couplings for joining dissimilar pipe materials with small difference in OD.

D. Aboveground sanitary-sewage force mains NPS 1-1/2 and NPS 2 shall be any of the following:

1. Hard copper tube, Type L; copper pressure fittings; and soldered joints.
2. Steel pipe, pressure fittings, and threaded joints.

## 2.10 PIPING INSTALLATION

- A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
  1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- B. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- C. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
  2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
  3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- D. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- E. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

## 2.11 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

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- B. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- C. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
- D. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- E. Grooved Joints: Assemble joint with keyed coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

2.12 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Install individual, straight, horizontal piping runs according to the following:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
  - 2. NPS 3: 60 inches with 1/2-inch rod.
  - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/4: 84 inches with 3/8-inch rod.
  - 2. NPS 1-1/2: 108 inches with 3/8-inch rod.

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3. NPS 2: 10 feet with 3/8-inch rod.
  4. NPS 2-1/2: 11 feet with 1/2-inch rod.
  5. NPS 3: 12 feet with 1/2-inch rod.
  6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
- I. Install supports for vertical steel piping every 15 feet.
- J. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 2: 84 inches with 3/8-inch rod.
  2. NPS 3: 96 inches with 1/2-inch rod.
  3. NPS 4: 108 inches with 1/2-inch rod.
- K. Install supports for vertical stainless-steel piping every 10 feet.
- L. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 72 inches with 3/8-inch rod.
  2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
  3. NPS 2-1/2: 108 inches with 1/2-inch rod.
  4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
- M. Install supports for vertical copper tubing every 10 feet.

## 2.13 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
  2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
  4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

## 2.14 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

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2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
  1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
  4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
  5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  6. Prepare reports for tests and required corrective action.

2.15 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION

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SECTION 22 34 13

INSTANTANEOUS, TANKLESS, GAS DOMESTIC WATER HEATERS

GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Indoor Tankless Gas Water Heaters.
  - 2. Outdoor Tankless Gas Water Heaters.
  - 3. Indoor or Outdoor Tankless Rack Systems.

1.2 DEFINITIONS

- A. Tankless Gas Domestic Water Heater: Internally or externally mounted, or freestanding, commercial condensing, multiple point-of-use, gas fired water heater.

1.3 SUBMITTALS

- A. Submit in accordance with requirements of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's technical data sheets, specifications, performance data and installation instructions for all products referenced in the scope of work defined in this section.
- C. Shop Drawings: Submit shop drawings required to depict the requirements for fabrication and installation. Include the following drawings as applicable:
  - 1. Include dimension drawings of water heaters indicating components and connections to other equipment and piping.
  - 2. Include heat-exchanger dimensions, size of tapings, and performance data.

1.4 CLOSEOUT SUBMITTALS

- A. Provide original manufacturer's installation and operation manuals.
- B. Provide written manufacturer's warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Primary products in this section to be provided by a manufacturer with no less than five years of experience producing the products specified in this section at a facility in the United States.
- B. Installer's Qualifications: All work specified in this section is to be completed by a firm with demonstrated experience installing systems similar in scope and complexity to those specified.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and products in accordance with the manufacturer's instructions and recommendations and industry standards.
- B. Store all materials in the manufacturer's original packaging until ready for installation. Protect all products from damage or exposure to adverse environmental conditions, including weather, humidity, and dust.
- C. Provide temporary inlet and outlet caps, maintain caps in place until installation.

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1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to replace products that fail within the specified warranty period.
  - 1. Failure Methods: Condensate corrosion, thermal stress, mechanical defects, or workmanship.
  - 2. Heat Exchanger: 15 years from date of Substantial Completion under standard or controlled regulation.
  - 3. All Other Parts and Components: 5 years from date of Substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Navien Inc.
  - 1. 20 Goodyear, Irvine, CA 92618.
  - 2. Website: [www.navieninc.com](http://www.navieninc.com).
  - 3. Phone: (800) 519-8794.
- B. Provide products by one of the following manufacturers subject to compliance with the requirements below:
  - 1. Navien Inc.
  - 2. Or Equal.
- C. Substitution Limitations:
  - 1. Submit substitution requests in accordance with provisions of Section 01 60 00.
  - 2. Single manufacturer to provide, from a single source, primary products and accessories specified in this section.

2.2 PERFORMANCE REQUIREMENTS

- A. Certifications: Provide products with heat exchanger that has the following certification labels.
  - 1. ANSI and CSA marks for the United States and Canada.
  - 2. AHRI certification for the United States and Canada.
  - 3. UL certification controller for recovery and external recirculation marks for the United States and Canada.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and use.
- C. ASHRAE/IES Compliance: Fabricate and label fuel-fired, domestic-water heaters to comply with ASHRAE/IES 90.1.
  - 1. Comply with efficiency requirements in ASHRAE 189.1, which supersede requirements in ASHRAE/IESNA 90.1.
- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 and NSF 372.
- E. Energy Star Compliance: Fabricate and label equipment in compliance with Energy Star requirements.
  - 1. Special Requirements: NSF 5 construction.
- F. High Altitude: approved up to 10,200 ft or (3,109 m).

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- G. SCAQMD Rule 1146.2 Type 1 Compliance: Provide units with low nitrous oxide emissions that meet or exceed 14 ng/j or 20 ppm NO<sub>x</sub> requirements at 3%.

## 2.3 SYSTEM REQUIREMENTS

- A. General: Provide tankless condensing water heater with microprocessor control and a direct electronic ignition system (with no standing pilot), fully modulating gas control valve, turbine flow meter, automatic electro-mechanical water flow control valve, and water temperature thermistors to maintain outlet water temperature between  $\pm 2^{\circ}\text{F}$  of set point temperature. Microprocessor shall have built in recirculation logic to control a pump's heating cycles.
- B. Controls: Provide an integrated temperature thermostat with an adjustable set point range of 96°F to 185°F.
- C. Error Memory: Provide water heater with no less than nine diagnostic maintenance codes that can be read via the display on the temperature thermostat controller.
- D. Emissions: Provide water heater that produces no more than 20 ppm NO<sub>x</sub> emissions when tested in accordance with the rules and regulations of the South Coast Air Quality Management District.
- E. Burners: Provide tankless water heater with downward fired fiber mesh burners, solid brass water flow control valve, and solid brass inlet and outlet water connections.
- F. Junction Box: Provide pre-installed electrical junction box.
- G. Heat Exchanger Construction: 400 series stainless steel.

## 2.4 INDOOR TANKLESS GAS WATER HEATERS.

- A. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
  - 1. Basis of Design Product: Navien NPE, Model 150S2.
  - 2. Uniform Energy Factor: 0.93.
  - 3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
  - 4. Fuel: Natural Gas or Propane.
    - a. Gas Consumption: 18,000 to 120,000 Btu/hr.
    - b. Gas Supply Pressure:
      - 1) Natural Gas: 3.5 to 10.5 inches of water column.
      - 2) Propane: 8.0 to 13.5 inches of water column.
  - 5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
    - a. Normal Usage: 52 Watts.
    - b. Max Current: 4 Amps.
  - 6. Hot Water Flow Rate Capacity: 6.8 GPM at 35°F temperature rise.
  - 7. Pressure Rating: 150 psi
  - 8. Heat Exchanger: Dual, stainless steel heat exchangers.
  - 9. Freeze Protection: For ambient temperatures as low as -5°F.
- B. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
  - 1. Basis of Design Product: Navien NPE, Model 180S2.
  - 2. Uniform Energy Factor: 0.96.
  - 3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
  - 4. Fuel: Natural Gas or Propane.
    - a. Gas Consumption: 10,000 to 150,000 Btu/hr.
    - b. Gas Supply Pressure:
      - 1) Natural Gas: 3.5 to 10.5 inches of water column.
      - 2) Propane: 8.0 to 13.5 inches of water column.
  - 5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
    - a. Normal Usage: 52 Watts.

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- b. Max Current: 4 Amps.
  - 6. Hot Water Flow Rate Capacity: 8.4 GPM at 35°F temperature rise.
  - 7. Pressure Rating: 150 psi
  - 8. Heat Exchanger: Dual, stainless steel heat exchangers.
  - 9. Freeze Protection: For ambient temperatures as low as -5°F.
- C. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
- 1. Basis of Design Product: Navien NPE, Model 180A2.
  - 2. Uniform Energy Factor: 0.95.
  - 3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
  - 4. Fuel: Natural Gas or Propane.
    - a. Gas Consumption: 10,000 to 150,000 Btu/hr.
    - b. Gas Supply Pressure:
      - 1) Natural Gas: 3.5 to 10.5 inches of water column.
      - 2) Propane: 8.0 to 13.5 inches of water column.
  - 5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
    - a. Normal Usage: 52 Watts.
    - b. Max Current: 4 Amps.
  - 6. Hot Water Flow Rate Capacity: 8.4 GPM at 35°F temperature rise.
  - 7. Pressure Rating: 150 psi
  - 8. Heat Exchanger: Dual, stainless steel heat exchangers.
  - 9. Freeze Protection: For ambient temperatures as low as -5°F.
  - 10. Recirculation Pump: Internal recirculation pump to provide a zero GPM activation rate.
  - 11. Buffer Tank: Provide Internal insulated 0.5-gallon buffer tank to eliminate the introduction of cold water into the hot water supply line on occasions of frequent on/off operations.
- D. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
- 1. Basis of Design Product: Navien NPE, Model 210S2.
  - 2. Uniform Energy Factor: 0.96.
  - 3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
  - 4. Fuel: Natural Gas or Propane.
    - a. Gas Consumption: 12,000 to 180,000 Btu/hr.
    - b. Gas Supply Pressure:
      - 1) Natural Gas: 3.5 to 10.5 inches of water column.
      - 2) Propane: 8.0 to 13.5 inches of water column.
  - 5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
    - a. Normal Usage: 52 Watts.
    - b. Max Current: 4 Amps.
  - 6. Hot Water Flow Rate Capacity: 10.1 GPM at 35°F temperature rise.
  - 7. Pressure Rating: 150 psi
  - 8. Heat Exchanger: Dual, stainless steel heat exchangers.
  - 9. Freeze Protection: For ambient temperatures as low as -5°F.
- E. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
- 1. Basis of Design Product: Navien NPE, Model 210A2.
  - 2. Uniform Energy Factor: 0.95.
  - 3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
  - 4. Fuel: Natural Gas or Propane.
    - a. Gas Consumption: 12,000 to 180,000 Btu/hr.
    - b. Gas Supply Pressure:
      - 1) Natural Gas: 3.5 to 10.5 inches of water column.
      - 2) Propane: 8.0 to 13.5 inches of water column.
  - 5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
    - a. Normal Usage: 52 Watts.
    - b. Max Current: 4 Amps.

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6. Hot Water Flow Rate Capacity: 10.1 GPM at 35°F temperature rise.
7. Pressure Rating: 150 psi
8. Heat Exchanger: Dual, stainless steel heat exchangers.
9. Freeze Protection: For ambient temperatures as low as -5°F.
10. Recirculation Pump: Internal recirculation pump to provide a zero GPM activation rate.
11. Buffer Tank: Provide Internal insulated 0.5-gallon buffer tank to eliminate the introduction of cold water into the hot water supply line on occasions of frequent on/off operations.

F. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.

1. Basis of Design Product: Navien NPE, Model 240S2.
2. Uniform Energy Factor: 0.96.
3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
4. Fuel: Natural Gas or Propane.
  - a. Gas Consumption: 13,300 to 199,900 Btu/hr.
  - b. Gas Supply Pressure:
    - 1) Natural Gas: 3.5 to 10.5 inches of water column.
    - 2) Propane: 8.0 to 13.5 inches of water column.
5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
  - a. Normal Usage: 52 Watts.
  - b. Max Current: 4 Amps.
6. Hot Water Flow Rate Capacity: 11.2 GPM at 35°F temperature rise.
7. Pressure Rating: 150 psi
8. Heat Exchanger: Dual, stainless steel heat exchangers.
9. Freeze Protection: For ambient temperatures as low as -5°F.

G. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.

1. Basis of Design Product: Navien NPE, Model 240A2.
2. Uniform Energy Factor: 0.95.
3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
4. Fuel: Natural Gas or Propane.
  - a. Gas Consumption: 13,300 to 199,900 Btu/hr.
  - b. Gas Supply Pressure:
    - 1) Natural Gas: 3.5 to 10.5 inches of water column.
    - 2) Propane: 8.0 to 13.5 inches of water column.
5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
  - a. Normal Usage: 52 Watts.
  - b. Max Current: 4 Amps.
6. Hot Water Flow Rate Capacity: 11.2 GPM at 35°F temperature rise.
7. Pressure Rating: 150 psi
8. Heat Exchanger: Dual, stainless steel heat exchangers.
9. Freeze Protection: For ambient temperatures as low as -5°F.
10. Recirculation Pump: Internal recirculation pump to provide a zero GPM activation rate.
11. Buffer Tank: Provide Internal insulated 0.5-gallon buffer tank to eliminate the introduction of cold water into the hot water supply line on occasions of frequent on/off operations.

## 2.5 TANKLESS RACK SYSTEMS

A. Tankless Free-Standing Rack System – Base Kit.

1. Capacity: Single unit, front mounted or Two unit, mounted Back to back.
2. Rack Frame: 1.5 inch square tube 14 gauge hot rolled steel.

B. Tankless Free-Standing Rack System – Add-on Kit.

1. Capacity: Additionl single unit mounted in-line or Two units, mounted Back to back, per Add-on Kit.
2. Rack Frame: 1.5 inch square tube 14 gauge hot rolled steel.

2.6

ACCESSORIES

- A. Venting System: Exhaust manifold shall be a minimum of 3", of either polypropylene or schedule 40 PVC/CPVC with horizontal or vertical termination.
  - 1. Provide common vent system allowing up to twelve (12) units to vent through 6" vent diameter in the same system.
  - 2. Provide system capable of configuring vent intake and exhaust in different pressure planes.
- B. Exhaust damper: provide common vent system with dampers that allows venting without check valves.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin work until adjacent substrates have been properly prepared to receive work specified in this section.
- B. Verify that locations of concealed reinforcements have been clearly marked for the installer.
- C. Locate reinforcement points and clearly mark their locations if not already done.

3.2 PREPARATION

- A. Clean surfaces prior to installation.
- B. Protect all adjacent surfaces from possible damage during installation of units.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Coordinate with plumbing piping, fuel piping, and related electrical work to achieve operating system.
- B. Install in accordance with manufacturer's current installation instructions, industry recognized best practices, and all code bodies having jurisdiction; do not install damaged products.
- C. Test for proper operation and adjust until satisfactory results are obtained, including start-up and check out procedures as recommended by the manufacturer.
- D. Protect adjacent finishes from damage during installation using manufacturer's recommendations.

3.4 CLEANING AND PROTECTION

- A. Clean and remove all grime or other soils using manufacturer's recommended methods.
- B. Damaged products must be repaired or replaced prior to substantial completion.
- C. Protect installed products until completion of work specified in this section.

END OF SECTION

SECTION 231123

FACILITY NATURAL GAS PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Pipes, tubes, and fittings.
  - 2. Piping specialties.
  - 3. Piping and tubing joining materials.
  - 4. Valves.
  - 5. Pressure regulators.
  - 6. Service meters.
  - 7. Concrete bases.

1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

1.4 PERFORMANCE REQUIREMENTS

- A. Minimum Operating Pressure Ratings:
  - 1. Piping and Valves: 125 psig minimum unless otherwise indicated.
  - 2. Service Regulators: 125 psig minimum unless otherwise indicated.
  - 3. Minimum Operating Pressure of Service Meter: 2 psig.
- B. Natural Gas System Pressure within Buildings: 0.5 psig but not more than 2 psig.
- C. Delegated Design: Design restraints and anchors for Natural Gas piping and equipment, including comprehensive engineering analysis by a qualified professional engineer, using performance

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requirements and design criteria indicated, or as approved under requirements of the Fuel Gas Code of this jurisdiction and approving authority.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
  - 1. Piping specialties.
  - 2. Steel piping, corrugated stainless steel tubing, associated components.
  - 3. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.
  - 4. Pressure regulators. Indicate pressure ratings and capacities.
  - 5. Service meters. Indicate pressure ratings and capacities. Include bypass fittings and meter bars.
  - 6. Dielectric fittings.
- B. Shop Drawings: For facility Natural Gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
  - 1. Shop Drawing Scale: 1/4 inch per foot.
  - 2. Detail mounting, supports, and valve arrangements for service meter assembly and pressure regulator assembly.
- C. Delegated Design Submittal: For Natural Gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Detail fabrication and assembly of seismic restraints.
  - 2. Design Calculations: Calculate requirements for selecting seismic restraints.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans and details, drawn to scale, on which Natural Gas piping is shown and coordinated with other installations, using input from installers of the items involved.
- B. Qualification Data: For qualified professional engineer.
- C. Welding certificates.
- D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For pressure regulators and service meters to include in emergency, operation, and maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and dispose of liquids from existing Natural Gas piping according to requirements of authorities having jurisdiction.
- B. Deliver pipes and tubes with factory applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- C. Store and handle pipes and tubes having factory applied protective coatings to avoid damaging coating, and protect from direct sunlight.

1.10 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.
- B. Interruption of Existing Natural Gas Service: Do not interrupt Natural Gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of Natural Gas supply according to requirements indicated:
  - 1. Notify Owner no fewer than two days in advance of proposed interruption of Natural Gas service.
  - 2. Do not proceed with interruption of Natural Gas service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
  - 1. Malleable iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  - 2. Wrought steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
  - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
  - 4. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
    - a. Material Group: 1.1.
    - b. End Connections: Threaded or butt welding to match pipe.
    - c. Lapped Face: Not permitted underground.

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- d. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
  - e. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.
5. Protective Coating for Underground Piping: Factory applied, three-layer coating of epoxy, adhesive, and PE.
- a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.
6. Mechanical Couplings:
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1) Dresser Piping Specialties; Division of Dresser, Inc.
    - 2) Smith-Blair, Inc.
  - b. Steel flanges and tube with epoxy finish.
  - c. Buna-nitrile seals.
  - d. Steel bolts, washers, and nuts.
  - e. Coupling shall be capable of joining PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
- B. Corrugated, Stainless steel Tubing: Comply with ANSI/IAS LC 1.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. OmegaFlex, Inc.
    - b. Parker Hannifin Corporation; Parflex Division.
    - c. Titeflex.
    - d. Tru-Flex Metal Hose Corp.
  - 2. Tubing: ASTM A 240/A 240M, corrugated, Series 300 stainless steel.
  - 3. Coating: PE with flame retardant.
    - a. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      - 1) Flame Spread Index: 25 or less.
      - 2) Smoke Developed Index: 50 or less.
  - 4. Fittings: Copper-alloy mechanical fittings with ends made to fit and listed for use with corrugated stainless steel tubing and capable of metal-to-metal seal without gaskets. Include brazing socket or threaded ends complying with ASME B1.20.1.
  - 5. Striker Plates: Steel, designed to protect tubing from penetrations.
  - 6. Manifolds: Malleable iron or steel with factory applied protective coating. Threaded connections shall comply with ASME B1.20.1 for pipe inlet and corrugated tubing outlets.
  - 7. Operating Pressure Rating: 5 psig (34.5 kPa).

## 2.2 PIPING SPECIALTIES

### A. Appliance Flexible Connectors:

1. Indoor, Fixed Appliance Flexible Connectors: Comply with ANSI Z21.24.
2. Indoor, Movable Appliance Flexible Connectors: Comply with ANSI Z21.69.
3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
4. Corrugated stainless steel tubing with polymer coating.
5. Operating Pressure Rating: 0.5 psig - 2.0 psig.
6. End Fittings: Zinc coated steel.
7. Threaded Ends: Comply with ASME B1.20.1.
8. Maximum Length: 72 inches

### B. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
3. Strainer Screen: [40] [60]-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig (862 kPa).

### C. Quick Disconnect Devices: Comply with ANSI Z21.41.

1. Copper alloy convenience outlet and matching plug connector.
2. Nitrile seals.
3. Hand operated with automatic shutoff when disconnected.
4. For indoor or outdoor applications.
5. Adjustable, retractable restraining cable.

### D. Weatherproof Vent Cap: Cast- or malleable iron increaser fitting with corrosion resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

## 2.3 JOINING MATERIALS

### A. Joint Compound and Tape: Suitable for natural gas.

### B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

### C. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F (540 deg C) complying with AWS A5.8/A5.8M. Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

## 2.4 MANUAL GAS SHUTOFF VALVES

### A. See "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.

### B. General Requirements for Metallic Valves, NPS 2 (DN 50) and Smaller: Comply with ASME B16.33.

1. CWP Rating: 125 psig.
2. Threaded Ends: Comply with ASME B1.20.1.

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3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
  4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch (25 mm) and smaller.
  6. Service Mark: Valves 1-1/4 inches (32 mm) to NPS 2 (DN 50) shall have initials "WOG" permanently marked on valve body.
- C. General Requirements for Metallic Valves, NPS 2-1/2 (DN 65) and Larger: Comply with ASME B16.38.
1. CWP Rating: 125 psig.
  2. Flanged Ends: Comply with ASME B16.5 for steel flanges.
  3. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  4. Service Mark: Initials "WOG" shall be permanently marked on valve body.
- D. Bronze Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Lee Brass Company.
    - b. McDonald, A. Y. Mfg. Co.
  2. Body: Bronze, complying with ASTM B 584.
  3. Plug: Bronze.
  4. Ends: Threaded, socket, or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  5. Operator: Square head or lug type with tamperproof feature where indicated.
  6. Pressure Class: 125 psig (862 kPa).
  7. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  8. Service: Suitable for Natural Gas service with "WOG" indicated on valve body.
- E. Cast Iron, Non-lubricated Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. McDonald, A. Y. Mfg. Co.
    - b. Mueller Co.; Gas Products Div.
    - c. Xomox Corporation; a Crane company.
  2. Body: Cast iron, complying with ASTM A 126, Class B.
  3. Plug: Bronze or nickel-plated cast iron.
  4. Seat: Coated with thermoplastic.
  5. Stem Seal: Compatible with natural gas.
  6. Ends: Threaded or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  7. Operator: Square head or lug type with tamperproof feature where indicated.
  8. Pressure Class: 125 psig (862 kPa).
  9. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  10. Service: Suitable for Natural Gas service with "WOG" indicated on valve body.

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F. Cast Iron, Lubricated Plug Valves: MSS SP-78.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Flowserve.
  - b. Homestead Valve; a division of Olson Technologies, Inc.
  - c. McDonald, A. Y. Mfg. Co.
  - d. Milliken Valve Company.
  - e. Mueller Co.; Gas Products Div.
2. Body: Cast iron, complying with ASTM A 126, Class B.
3. Plug: Bronze or nickel-plated cast iron.
4. Seat: Coated with thermoplastic.
5. Stem Seal: Compatible with natural gas.
6. Ends: Threaded or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
7. Operator: Square head or lug type with tamperproof feature where indicated.
8. Pressure Class: 125 psig (862 kPa).
9. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
10. Service: Suitable for Natural Gas service with "WOG" indicated on valve body.

2.5 PRESSURE REGULATORS

A. General Requirements:

1. Single stage and suitable for natural gas.
2. Steel jacket and corrosion resistant components.
3. Elevation compensator.
4. End Connections: Threaded for regulators NPS 2 (DN 50) and smaller; flanged for regulators NPS 2-1/2 (DN 65) and larger.

B. Line Pressure Regulators: Comply with ANSI Z21.80.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Meter Company.
  - b. Eclipse Combustion, Inc.
  - c. Fisher Control Valves and Regulators; Division of Emerson Process Management.
  - d. Maxitrol Company.
2. Body and Diaphragm Case: Cast iron or die cast aluminum.
3. Springs: Zinc plated steel; interchangeable.
4. Diaphragm Plate: Zinc plated steel.
5. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
6. Orifice: Aluminum; interchangeable.
7. Seal Plug: Ultraviolet stabilized, mineral filled nylon.
8. Single port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
9. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
10. Overpressure Protection Device: Factory mounted on pressure regulator.

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11. Atmospheric Vent: Factory- or field installed, stainless steel screen in opening if not connected to vent piping.
12. Maximum Inlet Pressure: 2 psig (13.8 kPa).

C. Appliance Pressure Regulators: Comply with ANSI Z21.18.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Eaton Corporation; Controls Div.
  - b. Maxitrol Company.
2. Body and Diaphragm Case: Die cast aluminum.
3. Springs: Zinc plated steel; interchangeable.
4. Diaphragm Plate: Zinc plated steel.
5. Seat Disc: Nitrile rubber.
6. Seal Plug: Ultraviolet stabilized, mineral filled nylon.
7. Factory applied Finish: Minimum three-layer polyester and polyurethane paint finish.
8. Regulator may include vent limiting device, instead of vent connection, if approved by authorities having jurisdiction.
9. Maximum Inlet Pressure: 2 psig (13.8 kPa).

2.6 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hart Industries International, Inc.
  - b. Jomar International Ltd.
  - c. Matco-Norca, Inc.
  - d. McDonald, A. Y. Mfg. Co.
  - e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
  - a. Standard: ASSE 1079.
  - b. Pressure Rating: 125 psig (860 kPa) minimum at 180 deg F (82 deg C).
  - c. End Connections: Solder joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Matco-Norca, Inc.
  - b. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - c. Wilkins; a Zurn company.

2. Description:
  - a. Standard: ASSE 1079.
  - b. Factory-fabricated, bolted, companion-flange assembly.
  - c. Pressure Rating: 125 psig (860 kPa) minimum at 180 deg F (82 deg C).
  - d. End Connections: Solder joint copper alloy and threaded ferrous; threaded Solder joint copper alloy and threaded ferrous.

D. Dielectric Flange Insulating Kits:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Advance Products & Systems, Inc.
  - b. Calpico, Inc.
  - c. Central Plastics Company.
  - d. Pipeline Seal and Insulator, Inc.
2. Description:
  - a. Nonconducting materials for field assembly of companion flanges.
  - b. Pressure Rating: 150 psig (1035 kPa).
  - c. Gasket: Neoprene or phenolic.
  - d. Bolt Sleeves: Phenolic or polyethylene.
  - e. Washers: Phenolic with steel backing washers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for Natural Gas piping system to verify actual locations of piping connections before equipment installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Close equipment shutoff valves before turning off natural gas to premises or piping section.
- B. Inspect Natural Gas piping according to The City of New York Fuel Gas Code to determine that Natural Gas utilization devices are turned off in piping section affected.
- C. Comply with The City of New York Fuel Gas Code requirements for prevention of accidental ignition.

3.3 INDOOR PIPING INSTALLATION

- A. Comply with The City of New York Fuel Gas Code for installation and purging of Natural Gas piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and

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other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install Natural Gas piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Verify final equipment locations for roughing-in.
- L. Comply with requirements in Sections specifying gas fired appliances and equipment for roughing-in requirements.
- M. Drips and Sediment Traps: Install drips at points where condensate may collect, including service meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches (75 mm) long and same size as connected pipe. Install with space below bottom of drip to allow removal plug or cap.
- N. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- O. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- P. Concealed Location Installations: Except as specified below, install concealed Natural Gas piping and piping installed under the building in containment conduit constructed of steel pipe with welded joints as described in Part 2. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.
  - 1. Above Accessible Ceilings: Natural Gas piping, fittings, valves, and regulators may be installed in accessible spaces without containment conduit.
  - 2. In Floors: Install Natural Gas piping with welded or brazed joints and protective coating in cast-in-place concrete floors. Cover piping to be cast in concrete slabs with minimum of 1-1/2 inches (38 mm) of concrete. Piping may not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Do not embed piping in concrete slabs containing quick-set additives or cinder aggregate.

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3. In Floor Channels: Install Natural Gas piping in floor channels. Channels must have cover and be open to space above cover for ventilation.
4. In Walls or Partitions: Protect tubing installed inside partitions or hollow walls from physical damage using steel striker barriers at rigid supports.
  - a. Exception: Tubing passing through partitions or walls does not require striker barriers.
5. Prohibited Locations:
  - a. Do not install Natural Gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
  - b. Do not install Natural Gas piping in solid walls or partitions.
  - c. Do not install Natural Gas piping in egress corridors.
- Q. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- R. Connect branch piping from top or side of horizontal piping.
- S. Install unions in pipes NPS 2 (DN 50) and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.
- T. Do not use Natural Gas piping as grounding electrode.
- U. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- V. Install pressure gage downstream from each line regulator. Pressure gages are specified in Section 230519 "Meters and Gages for HVAC Piping."
- W. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- X. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- Y. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

#### 3.4 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless steel tubing, corrugated aluminum tubing, or copper connector.
- B. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

#### 3.5 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:

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1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Welded Joints:

1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
2. Bevel plain ends of steel pipe.
3. Patch factory applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.

F. Flanged Joints: Install gasket material, size, type, and thickness appropriate for Natural Gas service. Install gasket concentrically positioned.

G. Flared Joints: Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not over tighten.

### 3.6 HANGER AND SUPPORT INSTALLATION

A. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

B. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

C. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 1 and Smaller: Maximum span, 96 inches ; minimum rod size, 3/8 inch.
2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
4. NPS 2-1/2 to NPS 3-1/2: Maximum span, 10 feet; minimum rod size, 1/2 inch.
5. NPS 4 and Larger: Maximum span, 10 feet; minimum rod size, 5/8 inch.

D. Install hangers for horizontal, corrugated stainless steel tubing with the following maximum spacing and minimum rod sizes:

1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch.

### 3.7 CONNECTIONS

A. Connect to utility's gas main according to utility's procedures and requirements.

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- B. Install Natural Gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- C. Install piping adjacent to appliances to allow service and maintenance of appliances.
- D. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas fired appliance and equipment. Install union between valve and appliances or equipment.
- E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.8 LABELING AND IDENTIFYING

- A. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for piping and valve identification.
- B. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.9 PAINTING

- A. Comply with requirements in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" for painting interior and exterior Natural Gas piping.
- B. Paint exposed, exterior metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties, except components, with factory applied paint or protective coating.

1. Alkyd System: MPI EXT 5.1D.

- a. Prime Coat: Alkyd anticorrosive metal primer.
- b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
- c. Topcoat: Exterior alkyd enamel semigloss or gloss.
- d. Color: Gray.

- C. Paint exposed, interior metal piping, valves, service regulators, service meters and meter bars, and piping specialties, except components with factory applied paint or protective coating.

1. Latex Over Alkyd Primer System: MPI INT 5.1Q.

- a. Prime Coat: Alkyd anticorrosive metal primer.
- b. Intermediate Coat: Interior latex matching topcoat.
- c. Topcoat: Interior latex (low sheen) or (semigloss).
- d. Color: Gray.

2. Alkyd System: MPI INT 5.1E.

- a. Prime Coat: Alkyd anticorrosive metal primer.
- b. Intermediate Coat: Interior alkyd matching topcoat.
- c. Topcoat: Interior alkyd (flat) or (semigloss).
- d. Color: Gray.

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- D. Damage and Touchup: Repair marred and damaged factory applied finishes with materials and by procedures to match original factory finish.

3.10 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  - 1. Test, inspect, and purge natural gas according to The City of New York Fuel Gas Code and authorities having jurisdiction.
- C. Natural Gas piping will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.11 DEMONSTRATION

- A. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain earthquake valves.
- B. Aboveground Natural Gas piping shall be one of the following:
  - 1. Steel pipe with malleable iron fittings and threaded joints.
  - 2. Steel pipe with wrought steel fittings and welded joints.
- C. Containment Conduit: Steel pipe with wrought steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.

3.12 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG

- A. Aboveground, branch piping NPS 1 and smaller shall be one of the following:
  - 1. Corrugated stainless steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
  - 2. Aluminum tube with flared fittings and joints.
  - 3. Steel pipe with malleable iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be one of the following:
  - 1. Steel pipe with malleable iron fittings and threaded joints.
  - 2. Steel pipe with wrought steel fittings and welded joints.
- C. Containment Conduit: Steel pipe with wrought steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
- D. Containment Conduit Vent Piping: Steel pipe with malleable iron fittings and threaded or wrought steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

3.13 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES MORE THAN 0.5 PSIG AND LESS THAN 2 PSIG

- A. Aboveground, branch piping NPS 1 and smaller shall be one of the following:
  - 1. Corrugated stainless steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
  - 2. Aluminum tube with flared fittings and joints.
  - 3. Steel pipe with malleable iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be one of the following:
  - 1. Steel pipe with malleable iron fittings and threaded joints.
  - 2. Steel pipe with steel welding fittings and welded joints.
- C. Containment Conduit: Steel pipe with wrought steel fittings and welded joints. Coat underground pipe and fittings with protective coating for steel piping.
- D. Containment Conduit Vent Piping: Steel pipe with malleable iron fittings and threaded or wrought steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

3.14 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Valves for pipe sizes NPS 2 and smaller at service meter shall be one of the following:
  - 1. Bronze plug valve.
- B. Valves for pipe sizes NPS 2-1/2 and larger at service meter shall be one of the following:
  - 1. Bronze plug valve.
  - 2. Cast Iron, non-lubricated plug valve.
- C. Distribution piping valves for pipe sizes NPS 2 and smaller shall be one of the following:
  - 1. Bronze plug valve.
- D. Distribution piping valves for pipe sizes NPS 2-1/2 (DN 65) and larger shall be one of the following:
  - 1. Bronze plug valve.
  - 2. Cast Iron, non-lubricated plug valve.
- E. Valves in branch piping for single appliance shall be one of the following:
  - 1. Bronze plug valve.

END OF Section

SECTION 23 3113

METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Work Included: Provide metal ducts in accordance with the Contract Documents. The "General Conditions Governing All Contracts" shall apply to all work under the contract. The work of this section shall include, but not be limited to, the following:
  - 1. Single-wall rectangular ducts and fittings.
  - 2. Single-wall round ducts and fittings.
  - 3. Sheet metal materials.
  - 4. Sealants and gaskets.
  - 5. Hangers and supports.
- B. Related Sections:
  - 1. Division 23 Section "Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.
  - 2. Division 23 Section "Testing, Adjusting, and Balancing" for testing, adjusting, and balancing requirements for metal ducts.

1.2 PERFORMANCE REQUIREMENTS

- A. Duct Construction: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".

1.3 SUBMITTALS

- A. Product Data: For each type of the following products:
  - 1. Liners and adhesives.
  - 2. Sealants and gaskets.
- B. Shop Drawings:
  - 1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
  - 2. Factory- and shop-fabricated ducts and fittings.
  - 3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
  - 4. Elevation of top of ducts.
  - 5. Dimensions of main duct runs from building grid lines.
  - 6. Fittings.

7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment and vibration isolation.

C. Welding certificates.

D. Field quality-control reports.

#### 1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

### PART 2 - PRODUCTS

#### 2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.

1. Manufacturers:

- a. Ductmate Industries, Inc.
- b. Nexus Inc.
- c. Ward Industries, Inc.

D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

E. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements,

materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- F. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.

1. Manufacturers:
  - a. Ductmate Industries, Inc.
  - b. Lockformer.
2. Duct Size: Maximum 30 inches wide and up to 2-inch wg pressure class.
3. Longitudinal Seams: Pittsburgh lock sealed with noncuring polymer sealant.

## 2.2 SINGLE-WALL ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
  2. Fabricate flat-oval ducts larger than 72 inches in width (major dimension) with butt-welded longitudinal seams.
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

## 2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
1. Galvanized Coating Designation: G90.
  2. Finishes for Surfaces Exposed to View: Mill phosphatized.

- C. PVC-Coated, Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
1. Galvanized Coating Designation: G90.
  2. Minimum Thickness for Factory-Applied PVC Coating: 4 mils thick.
  3. Coating Materials: Acceptable to authorities having jurisdiction for use on ducts listed and labeled by an NRTL for compliance with UL 181, Class 1.
- D. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.
- E. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.
- F. Factory- or Shop-Applied Antimicrobial Coating:
1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.
  2. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
  3. Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested according to ASTM D 3363.
  4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
  5. Shop-Applied Coating Color: Black.
  6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.
- G. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- H. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## 2.4 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Water-Based Joint and Seam Sealant:
1. Application Method: Brush on.
  2. Solids Content: Minimum 65 percent.
  3. Shore A Hardness: Minimum 20.
  4. Water resistant.
  5. Mold and mildew resistant.
  6. VOC: Maximum 75 g/L (less water).
  7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
  8. Service: Indoor or outdoor.
  9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

C. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. VOC: Maximum 395 g/L.
9. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
10. Service: Indoor or outdoor.
11. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Duct Accessories" for fire and smoke dampers.
- L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

### 3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 2. Outdoor, Supply-Air Ducts: Seal Class A.
  - 3. Outdoor, Exhaust Ducts: Seal Class C.
  - 4. Outdoor, Return-Air Ducts: Seal Class C.
  - 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
  - 6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
  - 7. Unconditioned Space, Exhaust Ducts: Seal Class C.
  - 8. Unconditioned Space, Return-Air Ducts: Seal Class B.
  - 9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
  - 10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
  - 11. Conditioned Space, Exhaust Ducts: Seal Class B.
  - 12. Conditioned Space, Return-Air Ducts: Seal Class C.

### 3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."
- B. Building Attachments: Fasteners appropriate for construction materials to which hangers are being attached.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

### 3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer.

3.7 DUCT CLEANING

- A. Clean new duct systems before testing, adjusting, and balancing.
- B. Use service openings for entry and inspection.
  - 1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Division 23 Section "Duct Accessories" for access panels and doors.
  - 2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
  - 3. Remove and reinstall ceiling to gain access during the cleaning process.
- C. Particulate Collection and Odor Control:
  - 1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
  - 2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.
- D. Clean the following components by removing surface contaminants and deposits:
  - 1. Air outlets and inlets (registers, grilles, and diffusers).
  - 2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
  - 3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
  - 4. Coils and related components.
  - 5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
  - 6. Supply-air ducts, dampers, actuators, and turning vanes.
  - 7. Dedicated exhaust and ventilation components and makeup air systems.

3.8 START UP

- A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing."

3.9 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
  - 1. Rectangular Ducts Located in the Basement or in Crawl Spaces: PVC-coated, galvanized sheet steel with thicker coating on duct exterior.
- B. Exhaust Ducts:

1. Pressure Class: Negative 2-inch wg
- C. Intermediate Reinforcement:
  1. Galvanized-Steel Ducts: Galvanized steel or carbon steel coated with zinc-chromate primer.
- D. Elbow Configuration:
  1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."
    - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
    - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
    - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."
  2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."
    - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
      - 1) Radius-to Diameter Ratio: 1.5.
    - b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
    - c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam or welded.
- E. Branch Configuration:
  1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."
    - a. Rectangular Main to Rectangular Branch: 45-degree entry.
    - b. Rectangular Main to Round Branch: Spin in.
  2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees." Saddle taps are permitted in existing duct.
    - a. Velocity 1000 fpm or Lower: 90-degree tap.
    - b. Velocity 1000 to 1500 fpm: Conical tap.
    - c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION

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SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.
3. Fire-alarm wire and cable.
4. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpha Wire; brand of Belden, Inc.
2. Encore Wire Corporation.
3. General Cable; Prysmian Group North America.
4. Southwire Company, LLC.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

E. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
3. Type XHHW-2: Comply with UL 44.

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2.2 METAL-CLAD CABLE, TYPE MC

- A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems; Atkore International.
  - 2. Alpha Wire; brand of Belden, Inc.
  - 3. Encore Wire Corporation.
  - 4. General Cable; Prysmian Group North America.
  - 5. Southwire Company, LLC.
- C. Standards:
  - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
  - 2. Comply with UL 1569.
- D. Circuits:
  - 1. Single circuit.
  - 2. Power-Limited Fire-Alarm Circuits: Comply with UL 1424.
- E. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- F. Ground Conductor: Insulated.
- G. Conductor Insulation:
  - 1. Type TFN/THHN/THWN-2: Comply with UL 83.
  - 2. Type XHHW-2: Comply with UL 44.
- H. Armor: Steel, interlocked.
- I. Jacket: PVC applied over armor.

2.3 FIRE-ALARM WIRE AND CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Allied Wire & Cable Inc.
  - 2. Prysmian Cables and Systems; Prysmian Group North America.
  - 3. Radix Wire.
  - 4. Southwire Company, LLC.
  - 5. West Penn Wire; brand of Belden, Inc.
- B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- C. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer.

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1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire-alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a two-hour rating.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600 V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
  1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
  2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.
  3. Multiconductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFN/THHN conductor insulation, copper drain wire, copper armor with red identifier stripe, NTRL listed for fire-alarm and cable tray installation, plenum rated.

## 2.4 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. 3M Electrical Products.
  2. ABB, Electrification Business.
  3. AFC Cable Systems; Atkore International.
  4. Hubbell Utility Solutions; Hubbell Incorporated.
  5. Ideal Industries, Inc.
  6. NSi Industries LLC.
  7. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
  1. Material: Copper.
  2. Type: Two hole with standard barrels.
  3. Termination: Compression.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders:
  1. Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits:
  1. Copper, Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

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- C. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533.13 "Conduits for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 INSTALLATION OF FIRE-ALARM WIRE AND CABLE

- A. Comply with NFPA 72.
- B. Wiring Method: Install wiring in metal pathway according to Section 280528 "Pathways for Electronic Safety and Security."
  - 1. Install plenum cable in environmental airspaces, including plenum ceilings.
  - 2. Fire-alarm circuits and equipment control wiring associated with fire-alarm system must be installed in a dedicated pathway system.
    - a. Cables and pathways used for fire-alarm circuits, and equipment control wiring associated with fire-alarm system, may not contain any other wire or cable.

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3. Signaling Line Circuits: Power-limited fire-alarm cables must not be installed in the same cable or pathway as signaling line circuits.

- C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- D. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.
- E. Color-Coding: Color-code fire-alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and another for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire-alarm system junction boxes and covers red.

### 3.5 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inch of slack.
- D. Comply with requirements in Section 284621.13 "Conventional Fire-Alarm Systems" for connecting, terminating, and identifying wires and cables.

### 3.6 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.7 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.8 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

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GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

SECTION 260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Grounding and bonding conductors.
2. Grounding and bonding clamps.
3. Grounding and bonding bushings.
4. Grounding and bonding hubs.
5. Grounding and bonding connectors.
6. Intersystem bonding bridge grounding connector.
7. Grounding and bonding busbars.
8. Grounding (earthing) electrodes.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product indicated.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. In addition to items specified in Section 260010 "Supplemental Requirements for Electrical," include the following:
  - a. Plans showing locations of grounding features described in "Field Quality Control" Article, including the following:
    - 1) Rod electrodes.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

A. Equipment Grounding Conductor:

1. General Characteristics: 600 V, THHN/THWN-2, copper wire or cable, green color, in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. ASTM - Bare Copper Grounding and Bonding Conductor:

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ERICO; brand of nVent Electrical plc.
  - b. Harger Lightning & Grounding; business of Harger, Inc.
2. Referenced Standards: Complying with one or more of the following:
  - a. Soft or Annealed Copper Wire: ASTM B3
  - b. Concentric-Lay Stranded Copper Conductor: ASTM B8.
  - c. Tin-Coated Soft or Annealed Copper Wire: ASTM B33.
  - d. 19-Wire Combination Unilay-Stranded Copper Conductor: ASTM B787/B787M.

## 2.2 GROUNDING AND BONDING CLAMPS

- A. Description: Clamps suitable for attachment of grounding and bonding conductors to grounding electrodes, pipes, tubing, and rebar.
- B. Performance Criteria:
  1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  2. Listing Criteria:
    - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
    - b. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.
- C. UL KDER and KDSH - Hex-Fitting-Type Pipe and Rod Grounding and Bonding Clamp:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. Cooper B-line; brand of Eaton, Electrical Sector.
    - c. Crouse-Hinds; brand of Eaton, Electrical Sector.
    - d. ERICO; brand of nVent Electrical plc.
    - e. Galvan Industries, Inc.; Electrical Products Division, LLC.
    - f. Harger Lightning & Grounding; business of Harger, Inc.
    - g. ILSCO.
    - h. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
    - i. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  2. General Characteristics:
    - a. Two pieces with zinc-plated bolts.
    - b. Clamp Material: Silicon bronze.
    - c. Listed for outdoor use.

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D. UL KDER and KDSH - U-Bolt-Type Pipe and Rod Grounding and Bonding Clamp:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Cooper B-line; brand of Eaton, Electrical Sector.
  - c. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - d. ERICO; brand of nVent Electrical plc.
  - e. Galvan Industries, Inc.; Electrical Products Division, LLC.
  - f. Harger Lightning & Grounding; business of Harger, Inc.
  - g. ILSCO.
  - h. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - i. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
2. General Characteristics:
  - a. Clamp Material: Bronze.
  - b. Listed for outdoor use.

E. UL KDER and KDSH - Strap-Type Pipe and Rod Grounding and Bonding Clamp:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Burndy; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - c. ERICO; brand of nVent Electrical plc.
  - d. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
2. General Characteristics:
  - a. Clamp Material: Copper or Tinned copper.
  - b. Listed for outdoor use.

2.3 GROUNDING AND BONDING BUSHINGS

- A. Description: Bonding bushings connect conduit fittings, tubing fittings, threaded metal conduit, and unthreaded metal conduit to metal boxes and equipment enclosures, and have one or more bonding screws intended to provide electrical continuity between bushing and enclosure. Grounding bushings have provision for connection of bonding or grounding conductor and may or may not also have bonding screws.
- B. Performance Criteria:
  1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  2. Listing Criteria:

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- a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- C. UL KDER - Bonding Bushing:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
    - c. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
    - d. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - 2. General Characteristics: Threaded bushing with insulated throat.
- D. UL KDER - Grounding Bushing:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
    - c. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
    - d. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - 2. General Characteristics: Threaded bushing with insulated throat and mechanical-type wire terminal.

## 2.4 GROUNDING AND BONDING HUBS

- A. Description: Hubs with certified grounding or bonding locknut.
- B. Performance Criteria:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. Listing Criteria:
    - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- C. UL KDER - Grounding and Bonding Hub:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. Burndy; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
    - c. Crouse-Hinds; brand of Eaton, Electrical Sector.
    - d. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.

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2. General Characteristics: Insulated, gasketed, watertight hub with mechanical-type wire terminal.

## 2.5 GROUNDING AND BONDING CONNECTORS

### A. Performance Criteria:

#### 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

#### 2. Listing Criteria:

- a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- b. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.

### B. UL KDER - Pressure-Type Grounding and Bonding Busbar Cable Connector:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Burndy; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
2. General Characteristics: Copper or copper alloy, for compression bonding of one or more conductor directly to copper busbar. Listed for direct burial.

### C. UL KDER - Lay-In Lug Mechanical-Type Grounding and Bonding Busbar Terminal:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. ILSCO.
2. General Characteristics: Mechanical-type, copper rated for direct burial terminal with set screw.

### D. UL KDER - Crimped Lug Pressure-Type Grounding and Bonding Busbar Terminal:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Harger Lightning & Grounding; business of Harger, Inc.
  - c. ILSCO.
2. General Characteristics: Cast silicon bronze, solderless compression-type wire terminals; with long barrel and two holes spaced on 5/8 or 1 inch centers for two-bolt connection to busbar.

### E. UL KDER - Crimped Pressure-Type Grounding and Bonding Cable Connector:

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Burndy; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - c. ILSCO.
2. General Characteristics: Crimp-and-compress connectors that bond to conductor when connector is compressed around conductor.
  - a. Copper, C and H shaped.

F. UL KDER - Split-Bolt Pressure-Type Grounding and Bonding Cable Connector:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. ERICO; brand of nVent Electrical plc.
2. General Characteristics: Bolts that surround cable and bond to cable under compression when nut is tightened.
  - a. Copper.

G. UL KDER - Signal Reference Grid Grounding and Bonding Connector:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Cooper B-line; brand of Eaton, Electrical Sector.
  - c. ERICO; brand of nVent Electrical plc.
  - d. Harger Lightning & Grounding; business of Harger, Inc.
2. General Characteristics: Combination of compression wire connectors, access floor grounding clamps, bronze U-bolt grounding clamps, and copper split-bolt connectors, designed for the purpose.

## 2.6 GROUNDING (EARTHING) ELECTRODES

- A. Description: Grounding electrodes include rod electrodes, ring electrodes, metal underground water pipes, metal building frames, concrete-encased electrodes, and pipe and plate electrodes.
- B. Performance Criteria:
  1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

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2. Listing Criteria:
  - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- C. UL KDER - Rod Electrode:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. ERICO; brand of nVent Electrical plc.
    - c. Galvan Industries, Inc.; Electrical Products Division, LLC.
    - d. Harger Lightning & Grounding; business of Harger, Inc.
  2. General Characteristics: Copper-clad steel; 3/4 inch by 10 ft.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine facility's grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of electrical system.
- B. Inspect test results of grounding system measured at point of electrical service equipment connection.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with connection of electrical service equipment only after unsatisfactory conditions have been corrected.

#### 3.2 SELECTION OF BUSBARS

- A. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  1. Install bus horizontally, on insulated spacers 2 inch minimum from wall, 6 inch above finished floor unless otherwise indicated.
  2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

#### 3.3 SELECTION OF GROUNDING AND BONDING CONDUCTORS

- A. Conductors: Install solid conductor for 8 AWG and smaller, and stranded conductors for 6 AWG and larger unless otherwise indicated.
- B. Custom-Length Insulated Equipment Bonding Jumpers: 6 AWG, 19-strand, Type THHN.
- C. Bonding Cable: 28 kcmil, 14 strands of 17 AWG conductor, 1/4 inch in diameter.

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- D. Bonding Conductor: 4 AWG or 6 AWG, stranded conductor.
- E. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch wide and 1/16 inch thick.
- F. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch wide and 1/16 inch thick.

### 3.4 SELECTION OF CONNECTORS

- A. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
  - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
  - 4. Connections to Structural Steel: Welded connectors.

### 3.5 INSTALLATION

- A. Comply with manufacturer's published instructions.
- B. Special Techniques:
  - 1. Conductors:
    - a. Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
  - 2. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
    - a. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
    - b. Make connections with clean, bare metal at points of contact.
    - c. Make aluminum-to-steel connections with stainless steel separators and mechanical clamps.
    - d. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
    - e. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
    - f. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
      - 1) Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate adjacent parts.
      - 2) Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
      - 3) Use exothermic-welded connectors for outdoor locations; if disconnect-type connection is required, use bolted clamp.

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- g. Grounding and Bonding for Piping:
    - 1) Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use bolted clamp connector or bolt lug-type connector to pipe flange by using one of lug bolts of flange. Where dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
    - 2) Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with bolted connector.
    - 3) Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
  - h. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
  - i. Grounding for Steel Building Structure: Install driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 ft apart.
3. Electrodes:
- a. Ground Rods: Drive rods until tops are 2 inch below finished floor or final grade unless otherwise indicated.
    - 1) Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
    - 2) Use exothermic welds for below-grade connections.
  - b. For grounding electrode system, install at least **[three]** **<Insert number>** rods spaced at least one-rod length from each other and located at least same distance from other grounding electrodes, and connect to service grounding electrode conductor.
  - c. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and must be at least 12 inch deep, with cover.
    - 1) Install at least one test well for each service unless otherwise indicated. Install at ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
4. Grounding at Service:
- a. Equipment grounding conductors and grounding electrode conductors must be connected to ground bus. Install main bonding jumper between neutral and ground buses.
5. Grounding Separately Derived Systems:
- a. Generator: Install grounding electrode(s) at generator location. Electrode must be connected to equipment grounding conductor and to frame of generator.
6. Grounding Underground Distribution System Components:

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- a. Duct-Bank Grounding Conductor: Bury 12 inch above duct bank when indicated as part of duct-bank installation.
  - b. Comply with IEEE C2 grounding requirements.
  - c. Grounding Manholes and Handholes: Install driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inch will extend above finished floor. If necessary, install ground rod before manhole is placed and provide 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inch above to 6 inch below concrete. Seal floor opening with waterproof, nonshrink grout.
  - d. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields in accordance with manufacturer's published instructions with splicing and termination kits.
  - e. Pad-Mounted Transformers and Switches: Install two ground rods and ring electrode around pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than 2 AWG for ring electrode and for taps to equipment grounding terminals. Bury ring electrode not less than 6 inch from foundation.
7. Equipment Grounding:
- a. Install insulated equipment grounding conductors with feeders and branch circuits.
  - b. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
    - 1) Feeders and branch circuits.
    - 2) Lighting circuits.
    - 3) Receptacle circuits.
    - 4) Single-phase motor and appliance branch circuits.
    - 5) Three-phase motor and appliance branch circuits.
    - 6) Flexible raceway runs.
    - 7) Armored and metal-clad cable runs.
    - 8) Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
    - 9) X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment.
  - c. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
  - d. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
  - e. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

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3.6 FIELD QUALITY CONTROL

- A. Field tests and inspections must be witnessed by authorities having jurisdiction.
- B. Tests and Inspections:
  - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with calibrated torque wrench in accordance with manufacturer's published instructions.
  - 3. Test completed grounding system at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method in accordance with IEEE Std 81.
    - c. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.
  - 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to record of tests and observations. Include number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Nonconforming Work:
  - 1. Grounding system will be considered defective if it does not pass tests and inspections.
  - 2. Remove and replace defective components and retest.
- D. Collect, assemble, and submit test and inspection reports.
  - 1. Report measured ground resistances that exceed the following values:
    - a. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10  $\Omega$ .

3.7 PROTECTION

- A. After installation, protect grounding and bonding cables and equipment from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

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SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Support for conductors in vertical conduit.
4. Structural steel for fabricated supports and restraints.
5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
6. Fabricated metal equipment support assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32 inch diameter holes at a maximum of 8 inch on center in at least one surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Allied Tube & Conduit; Atkore International.
  - c. Cooper B-line; brand of Eaton, Electrical Sector.
  - d. Unistrut; Atkore International.
  - e. Wesanco, Inc.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
4. Channel Width: Selected for applicable load criteria.
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

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- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs must have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body must be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Hilti, Inc.
      - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 3) MKT Fastening, LLC.
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Cooper B-line; brand of Eaton, Electrical Sector.
      - 2) Empire Industries, Inc.
      - 3) Hilti, Inc.
      - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 5) MKT Fastening, LLC.
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325.
  - 6. Toggle Bolts: All steel springhead type.
  - 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

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PART 3 - EXECUTION

3.1 SELECTION

- A. Comply with the following standards for selection and installation of hangers and supports, except where requirements on Drawings or in this Section are stricter:
  - 1. NECA NEIS 101
- B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways specified in Section 260533.13 "Conduits for Electrical Systems."
- D. Comply with requirements for boxes specified in Section 260533.16 "Boxes and Covers for Electrical Systems."
- E. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and ERM as required by NFPA 70. Minimum rod size must be 1/4 inch in diameter.
- F. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.2 INSTALLATION OF SUPPORTS

- A. Comply with NECA NEIS 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination must be weight of supported components plus 200 lb.
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners.
  - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inch thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inch thick.
  - 6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
  - 7. To Light Steel: Sheet metal screws.

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- 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

END OF SECTION

SECTION 260533.13

CONDUITS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Type EMT-S duct raceways and elbows.
  - 2. Type ERMC-S duct raceways, elbows, couplings, and nipples.
  - 3. Type FMC-S duct raceways.
  - 4. Type IMC duct raceways.
  - 5. Type LFMC duct raceways.
  - 6. Fittings for conduit, tubing, and cable.
  - 7. Electrically conductive corrosion-resistant compounds for threaded conduit.
- B. Products Installed, but Not Furnished, under This Section:
  - 1. See Section 260553 "Identification for Electrical Systems" for electrical equipment labels.
- C. Related Requirements:
  - 1. Section 260519 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).

1.2 DEFINITIONS

- A. Conduit: A structure containing one or more duct raceways.
- B. Duct Raceway: A single enclosed raceway for conductors or cable.

1.3 ACTION SUBMITTALS

- A. Product Data:
  - 1. Type EMT-S duct raceways and elbows.
  - 2. Type ERMC-S duct raceways, elbows, couplings, and nipples.
  - 3. Type FMC-S duct raceways.
  - 4. Type IMC duct raceways.
  - 5. Type LFMC duct raceways.
  - 6. Fittings for conduit, tubing, and cable.
  - 7. Electrically conductive corrosion-resistant compounds for threaded conduit.

PART 2 - PRODUCTS

2.1 TYPE EMT-S DUCT RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN FJMX; including UL 797.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL FJMX - Steel Electrical Metal Tubing (EMT-S) and Elbows:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Allied Tube & Conduit; Atkore International.
  - b. Calconduit; Atkore International.
  - c. Wheatland Tube; Zekelman Industries.
2. Material: Steel.
3. Options:
  - a. Exterior Coating: Zinc.
  - b. Interior Coating: Zinc with organic top coating.
  - c. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.2 TYPE ERM-C-S DUCT RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DYIX; including UL 6.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL DYIX - Galvanized-Steel Electrical Rigid Metal Conduit (ERM-C-S-G), Elbows, Couplings, and Nipples:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

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- a. Allied Tube & Conduit; Atkore International.
  - b. Calconduit; Atkore International.
  - c. Wheatland Tube; Zekelman Industries.
2. Exterior Coating: Zinc.
3. Options:
  - a. Interior Coating: Zinc with organic top coating.
  - b. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.3 TYPE FMC-S DUCT RACEWAYS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DXUZ; including UL 1.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL DXUZ - Steel Flexible Metal Conduit (FMC-S):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Electri-Flex Company.
2. Material: Steel.
3. Options:
  - a. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.4 TYPE IMC DUCT RACEWAYS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DYBY; including UL 1242.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

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C. UL DYBY - Steel Intermediate Metal Conduit (IMC):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Allied Tube & Conduit; Atkore International.
  - c. Calconduit; Atkore International.
  - d. Wheatland Tube; Zekelman Industries.
2. Options:
  - a. Exterior Coating: Zinc.
  - b. Interior Coating: Zinc with organic top coating.
  - c. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.5 TYPE LFMC DUCT RACEWAYS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DXHR; including UL 360.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL DXHR - Steel Liquidtight Flexible Metal Conduit (LFMC-S):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Electri-Flex Company.
2. Material: Steel.
3. Options:
  - a. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.6 FITTINGS FOR CONDUIT, TUBING, AND CABLE

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

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B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL DWTT - Fittings for Type ERM, Type IMC, Type PVC, Type HDPE, Type EPEC, and Type RTRC Duct Raceways:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - c. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - d. Southwire Company, LLC.
2. Listing Criteria: UL CCN DWTT; including UL 514B.
3. Options:
  - a. Material: Steel.
  - b. Coupling Method: Compression coupling or Raintight compression coupling with distinctive color gland nut.
  - c. Expansion and Deflection Fittings: UL 651 with flexible bonding jumper.

D. UL FKAV - Fittings for Type EMT Duct Raceways:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Allied Tube & Conduit; Atkore International.
  - c. Calconduit; Atkore International.
  - d. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - e. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - f. Southwire Company, LLC.
2. Listing Criteria: UL CCN FKAV; including UL 514B.
3. Options:
  - a. Material: Steel.
  - b. Coupling Method: Setscrew coupling. Setscrew couplings with only single screw per conduit are unacceptable.
  - c. Expansion and Deflection Fittings: UL 651 with flexible bonding jumper.

E. UL ILNR - Fittings for Type FMC Duct Raceways:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. Southwire Company, LLC.
2. Listing Criteria: UL CCN ILNR; including UL 514B.

2.7 ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT COMPOUNDS FOR THREADED CONDUIT

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN FOIZ; including UL Subject 2419.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL FOIZ - Electrically Conductive Corrosion-Resistant Compound for Threaded Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. ABB, Electrification Business.

PART 3 - EXECUTION

3.1 SELECTION OF CONDUITS FOR ELECTRICAL SYSTEMS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of duct raceways. Consult Architect for resolution of conflicting requirements.

B. Special Instructions Regarding HDPE Conduits: Although Article 353 of NFPA 70 permits use of HDPE conduits where encased in concrete aboveground, UL CCN EAZX listing requirements state that HDPE underground conduits are intended only for use where direct buried with or without being encased in concrete. Specified Type HDPE underground conduits are not permitted to be used aboveground on Project.

C. Outdoors:

1. Exposed and Subject to Severe Physical Damage: ERMCM.
2. Exposed and Subject to Physical Damage: ERMCM.
  - a. Locations less than 2.5 m (8 ft) above finished floor.
3. Exposed and Not Subject to Physical Damage: ERMCM or IMCM.
4. Concealed Aboveground: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

D. Indoors:

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1. Hazardous Classified Locations: ERMIC.
2. Exposed and Subject to Severe Physical Damage: ERMIC. Locations include the following:
  - a. Loading docks.
  - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
  - c. Mechanical rooms.
  - d. Gymnasiums.
3. Exposed and Subject to Physical Damage: ERMIC. Locations include the following:
  - a. Locations less than 2.5 m (8 ft) above finished floor.
  - b. Stub-ups to above suspended ceilings.
4. Exposed and Not Subject to Physical Damage: EMT.
5. Concealed in Ceilings and Interior Walls and Partitions: EMT.
6. Damp or Wet Locations: ERMIC or IMC.
7. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC or FMC.

E. Duct Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMIC and IMC: Provide threaded-type fittings unless otherwise indicated.

### 3.2 INSTALLATION OF CONDUITS FOR ELECTRICAL SYSTEMS

- A. Comply with manufacturer's published instructions.
- B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:
  1. Type EMT-S: Article 358 of NFPA 70 and NECA NEIS 101.
  2. Type ERMIC-S: Article 344 of NFPA 70 and NECA NEIS 101.
  3. Type FMC-S: Article 348 of NFPA 70 and NECA NEIS 101.
  4. Type IMC: Article 342 of NFPA 70 and NECA NEIS 101.
  5. Type LFMC: Article 350 of NFPA 70 and NECA NEIS 101.
  6. Expansion Fittings: NEMA FB 2.40.
  7. Consult Architect for resolution of conflicting requirements.
- C. Special Installation Techniques:
  1. General Requirements for Installation of Duct Raceways:
    - a. Complete duct raceway installation before starting conductor installation.
    - b. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft above finished floor.
    - c. Make bends in duct raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
    - d. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
    - e. Support conduit within 12 inch of enclosures to which attached.

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- f. Install duct sealing fittings at accessible locations in accordance with NFPA 70 and fill them with listed sealing compound. For concealed duct raceways, install fitting in flush steel box with blank cover plate having finish similar to that of adjacent plates or surfaces. Install duct sealing fittings in accordance with NFPA 70.
  - g. Install devices to seal duct raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of duct raceways at the following points:
    - 1) Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
    - 2) Where an underground service duct raceway enters a building or structure.
    - 3) Conduit extending from interior to exterior of building.
    - 4) Conduit extending into pressurized duct raceway and equipment.
    - 5) Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
    - 6) Where otherwise required by NFPA 70.
  - h. Do not install duct raceways or electrical items on "explosion-relief" walls or rotating equipment.
  - i. Do not install conduits within 2 inch of the bottom side of a metal deck roof.
  - j. Keep duct raceways at least 6 inch away from parallel runs of flues and steam or hot-water pipes. Install horizontal duct raceway runs above water and steam piping.
  - k. Cut conduit perpendicular to the length. For conduits metric designator 53 (trade size 2) and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
  - l. Install pull wires in empty duct raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb tensile strength. Leave at least 12 inch of slack at both ends of pull wire. Cap underground duct raceways designated as spare above grade alongside duct raceways in use.
  - m. Install duct raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.
    - 1) Termination fittings with shoulders do not require two locknuts.
  - n. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to metric designator 35 (trade size 1-1/4) and insulated throat metal bushings on metric designator 41 (trade size 1-1/2) and larger conduits terminated with locknuts.
2. Types ERM and IMC:
- a. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound that maintains electrical conductivity to threads of duct raceway and fittings before making up joints. Follow compound manufacturer's published instructions.
3. Types FMC, LFMC, and LFNC:
- a. Provide a maximum of 36 inch of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
4. Stub-ups to Above Recessed Ceilings:
- a. Provide EMT, IMC, or ERM for duct raceways.

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- b. Provide a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- 5. Duct Raceway Terminations at Locations Subject to Moisture or Vibration:
  - a. Provide insulating bushings to protect conductors, including conductors smaller than 4 AWG. Install insulated throat metal grounding bushings on service conduits.
- 6. Duct Fittings: Install fittings in accordance with NEMA FB 2.10 guidelines.
  - a. EMT: Provide setscrew, steel fittings. Comply with NEMA FB 2.10.
  - b. Flexible Conduit: Provide only fittings listed for use with flexible conduit type. Comply with NEMA FB 2.20.
- D. Interfaces with Other Work:
  - 1. Coordinate with Section 078413 "Penetration Firestopping" for installation of firestopping at penetrations of fire-rated floor and wall assemblies.
  - 2. Coordinate with Section 260529 "Hangers and Supports for Electrical Systems" for installation of conduit hangers and supports.

3.3 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION

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BOXES AND COVERS FOR ELECTRICAL SYSTEMS

SECTION 260533.16

BOXES AND COVERS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metallic outlet boxes, device boxes, rings, and covers.
2. Nonmetallic outlet boxes, device boxes, rings, and covers.
3. Junction boxes and pull boxes.
4. Cover plates for device boxes.
5. Hoods for outlet boxes.

B. Products Installed, but Not Furnished, under This Section:

1. See Section 260553 "Identification for Electrical Systems" for electrical equipment labels.

C. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 260011 "Facility Performance Requirements for Electrical" for seismic-load, wind-load, acoustical, and other field conditions applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Metallic outlet boxes, device boxes, rings, and covers.
2. Nonmetallic outlet boxes, device boxes, rings, and covers.
3. Junction boxes and pull boxes.
4. Cover plates for device boxes.
5. Hoods for outlet boxes.

PART 2 - PRODUCTS

2.1 METALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

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2. Listing Criteria: UL CCN QCIT; including UL 514A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.
3. Samples:
  - a. Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
  - b. Raised Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
  - c. Recessed Access-Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
  - d. Concrete Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.

C. UL QCIT - Metallic Outlet Boxes and Covers:

1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - c. Hubbell Premise Wiring; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - d. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - e. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - f. Pass & Seymour; Legrand North America, LLC.
  - g. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - h. Wiremold; Legrand North America, LLC.
3. Options:
  - a. Material: Sheet steel.
  - b. Sheet Metal Depth: Minimum 1.5 inch.
  - c. Luminaire Outlet Boxes and Covers: Nonadjustable, listed and labeled for attachment of luminaire weighing up to 50 lb.
  - d. Paddle Fan Outlet Boxes and Covers: Nonadjustable, designed for attachment of paddle fan weighing up to 70 lb.

D. UL QCIT - Metallic Conduit Bodies:

1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.

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2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - c. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - d. Pass & Seymour; Legrand North America, LLC.
  - e. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.

E. UL QCIT - Metallic Device Boxes:

1. Description: Box with provisions for mounting wiring device directly to box.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - c. Hubbell Premise Wiring; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - d. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - e. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - f. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
3. Options:
  - a. Material: Sheet steel.
  - b. Sheet Metal Depth: minimum 1.5 inch.

F. UL QCIT - Metallic Extension Rings:

1. Description: Ring intended to extend sides of outlet box or device box to increase box depth, volume, or both.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - c. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - d. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - e. Pass & Seymour; Legrand North America, LLC.
  - f. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.

2.2 JUNCTION BOXES AND PULL BOXES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. Listing Criteria: UL CCN BGUZ; including UL 50 and UL 50E.

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B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL BGUZ - Indoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Industrial Controls; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - c. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - d. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.

D. UL BGUZ - Indoor Cast-Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Crouse-Hinds; brand of Eaton, Electrical Sector.
  - b. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.

E. UL BGUZ - Outdoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Industrial Controls; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - c. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.
  - d. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.

F. UL BGUZ - Outdoor Cast-Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Crouse-Hinds; brand of Eaton, Electrical Sector.

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- b. O-Z/Gedney; brand of Emerson Electric Co., Automation Solutions, Appleton Group.

G. UL BGUZ - Outdoor Polymeric Junction and Pull Boxes:

- 1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
- 2. <Double click here to find, evaluate, and insert list of manufacturers and products.>

2.3 HOODS FOR OUTLET BOXES

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. Listing Criteria:
  - a. UL CCN QCIT or UL CCN QCMZ; including UL 514D.
  - b. Receptacle, Hood, Cover Plate, Gaskets, and Seals: UL 498 Supplement SA when mated with box or enclosure complying with UL 514A, UL 514C, or UL 50E.
- 3. Mounts to box using fasteners different from wiring device.

B. Source Quality Control:

- 1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
- 2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL QCIT or QCMZ - Retractable or Reattachable Hoods for Outlet Boxes:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
- 2. Options:
  - a. Provides clear, weatherproof, "while-in-use" cover.

D. UL QCIT or QCMZ - Extra-Duty, While-in-Use Hoods for Outlet Boxes:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Raco Taymac Bell; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
- 2. Additional Characteristics: Marked "Extra-Duty" in accordance with UL 514D.
- 3. Options:

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- a. Provides clear, weatherproof, "while-in-use" cover.
- b. Manufacturer may combine nonmetallic device box with hood as extra-duty rated assembly.

PART 3 - EXECUTION

3.1 SELECTION OF BOXES AND COVERS FOR ELECTRICAL SYSTEMS

- A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of boxes and enclosures. Consult Architect for resolution of conflicting requirements.
- B. Degree of Protection:
  - 1. Outdoors:
    - a. Type 3R unless otherwise indicated.
    - b. Locations Exposed to Hosedown: Type 4.
    - c. Locations Subject to Potential Flooding: Type 6P.
    - d. Locations Aboveground Where Mechanism Must Operate When Ice Covered: Type 3S.
    - e. Locations in-Ground or Exposed to Corrosive Agents: Type 4X.
    - f. Locations in-Ground or Exposed to Corrosive Agents Where Mechanism Must Operate When Ice Covered: Type 3SX.
  - 2. Indoors:
    - a. Type 1 unless otherwise indicated.
    - b. Damp or Dusty Locations: Type 12.
    - c. Surface Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
    - d. Flush Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
    - e. Locations Exposed to Airborne Dust, Lint, Fibers, or Flyings: Type 4.
    - f. Locations Exposed to Hosedown: Type 4.
    - g. Locations Exposed to Brief Submersion: Type 6.
    - h. Locations Exposed to Prolonged Submersion: Type 6P.
    - i. Locations Exposed to Corrosive Agents: Type 4X.
    - j. Locations Exposed to Spraying Oil or Coolants: Type 13.
- C. Exposed Boxes Installed Less Than 2.5 m (8 ft) Above Floor:
  - 1. Boxes with knockouts or unprotected openings are prohibited.
  - 2. Provide exposed cover. Flat covers with angled mounting slots or knockouts are prohibited.

3.2 INSTALLATION OF BOXES AND COVERS FOR ELECTRICAL SYSTEMS

- A. Comply with manufacturer's published instructions.
- B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:
  - 1. Outlet, Device, Pull, and Junction Boxes: Article 314 of NFPA 70.

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2. Consult Architect for resolution of conflicting requirements.

C. Special Installation Techniques:

1. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures.
2. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
3. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
4. Locate boxes so that cover or plate will not span different building finishes.
5. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.
6. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.
7. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.
8. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.

3.3 PROTECTION

- A. After installation, protect boxes from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

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SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

SECTION 260533.23

SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Surface metal raceways and fittings.
2. Strut-type channel raceways and fittings.
3. Wireways and auxiliary gutters.

B. Products Installed, but Not Furnished, under This Section:

1. See Section 260553 "Identification for Electrical Systems" for electrical equipment labels.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Surface metal raceways and fittings.
2. Strut-type channel raceways and fittings.
3. Wireways and auxiliary gutters.

PART 2 - PRODUCTS

2.1 SURFACE METAL RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN RJBT; including UL 5.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL RJBT - Surface Metal Raceways and Fittings with Metal Covers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

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- a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
- b. Wiremold; Legrand North America, LLC.

2. Options:

- a. Galvanized steel base with snap-on covers.
- b. Manufacturer's standard enamel finish in color selected by Architect.
- c. Wiring Channels: Single, Dual, or Triple. Multiple channels must be capable of housing a standard 20 to 30 A device flush within the raceway.

2.2 STRUT-TYPE CHANNEL RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria:
  - a. UL CCN RIUU; including UL 5B.
  - b. UL 94, V-0 requirements for self-extinguishing characteristics.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

C. UL RIUU - Strut-Type Channel Raceways and Fittings with Metallic Covers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ABB, Electrification Business.
  - b. Cooper B-line; brand of Eaton, Electrical Sector.
  - c. Power-Strut; Atkore International.
  - d. Unistrut; Atkore International.

2.3 WIREWAYS AND AUXILIARY GUTTERS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria:
  - a. UL CCN ZOYX; including UL 870.
  - b. UL 94, V-0 requirements for self-extinguishing characteristics.

B. Source Quality Control:

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1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
- C. UL ZOYX - Metal Wireways and Auxiliary Gutters:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ABB, Electrification Business.
    - b. Cooper B-line; brand of Eaton, Electrical Sector.
    - c. Square D; Schneider Electric USA.
  2. Additional Characteristics:
    - a. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
    - b. Finish: Manufacturer's standard enamel finish.
  3. Options:
    - a. Degree of Protection: Type 1 unless otherwise indicated.
    - b. Wireway Covers: Screw-cover type unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION OF SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

- A. Comply with manufacturer's published instructions.
- B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:
1. Auxiliary Gutters: Article 366 of NFPA 70.
  2. Surface Metal Raceway: Article 386 of NFPA 70.
  3. Consult Architect for resolution of conflicting requirements.
- C. Special Installation Techniques:
1. Install surface raceways only where indicated on Drawings.
  2. Install surface raceway with a minimum 2 inch radius control at bend points.
  3. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inch and with no less than two supports per straight raceway section. Support surface raceway in accordance with manufacturer's published instructions. Tape and glue are unacceptable support methods.
  4. Identification: Provide labels for surface raceways and associated electrical equipment.
    - a. Identify field-installed conductors, interconnecting wiring, and components.
    - b. Provide warning signs.

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3.2 PROTECTION

- A. After installation, protect surface raceways from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

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SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

SECTION 260544

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Sleeve-seal systems.
  - 2. Grout.

1.2 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. CALPICO, Inc.
  - 2. Flexicraft Industries.
  - 3. Metraflex Company (The).
- B. General Characteristics: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable or between raceway and cable.
- C. Options:
  - 1. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
  - 2. Pressure Plates: Carbon steel.
  - 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.2 GROUT

- A. General Characteristics: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
  - 1. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
  - 2. Design Mix: 5000 psi, 28-day compressive strength.
  - 3. Packaging: Premixed and factory packaged.

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SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 3 - EXECUTION

3.1 INSTALLATION OF SLEEVES FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Sleeves for Conduits Penetrating Above-Grade, Non-Fire-Rated, Concrete and Masonry-Unit Floors and Walls:
  - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
    - a. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall or floor so no voids remain. Tool exposed surfaces smooth; protect material while curing.
    - b. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
  - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 3. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Wall Assemblies:
  - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 2. Seal space outside of sleeves with approved joint compound for wall assemblies.
- C. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve-seal systems. Size sleeves to allow for 1 inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

3.2 INSTALLATION OF SLEEVE-SEAL SYSTEMS

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION

SECTION 260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Labels.
  - 2. Tapes and stencils.
  - 3. Signs.
  - 4. Miscellaneous identification products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1.
- B. Signs, labels, and tags required for personnel safety must comply with the following standards:
  - 1. Safety Colors: NEMA Z535.1.
  - 2. Facility Safety Signs: NEMA Z535.2.
  - 3. Safety Symbols: NEMA Z535.3.
  - 4. Product Safety Signs and Labels: NEMA Z535.4.
  - 5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.
- C. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, must comply with UL 969.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Color-Coding for Phase- and Voltage-Level Identification, 1000 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
  - 1. Color must be factory applied.
  - 2. Colors for 240 V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.

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3. Color for Neutral: White.
4. Color for Equipment Grounds: Green.

B. Equipment Identification Labels:

1. Black letters on white field.
2. **<Insert specific requirements for equipment to be labeled, such as transformers, panelboards, etc.>.**

## 2.3 LABELS

A. Self-Adhesive Labels: Polyester, thermal, transfer-printed, 3 mil thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Brother International Corporation.
  - c. Ideal Industries, Inc.
  - d. LEM Products Inc.
  - e. Marking Services Inc.
  - f. Panduit Corp.
  - g. emedco.
2. Minimum Nominal Size:
  - a. 1-1/2 by 6 inch for raceway and conductors.
  - b. 3-1/2 by 5 inch for equipment.
  - c. As required by authorities having jurisdiction.

## 2.4 TAPES AND STENCILS

A. Floor Marking Tape: 2 inch wide, 5 mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. Brady Corporation.

## 2.5 SIGNS

A. Baked-Enamel Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Marking Services Inc.
  - c. emedco.

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2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
3. 1/4 inch grommets in corners for mounting.
4. Nominal Size: 7 by 10 inch.

B. Metal-Backed Butyrate Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Marking Services Inc.
  - c. emedco.
2. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396 inch galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
3. 1/4 inch grommets in corners for mounting.
4. Nominal Size: 10 by 14 inch.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Marking Services Inc.
  - c. emedco.
2. Engraved legend.
3. Thickness:
  - a. For signs up to 20 sq. inch, minimum 1/16 inch thick.
  - b. For signs larger than 20 sq. inch, 1/8 inch thick.
  - c. Engraved legend with black letters on white face.
  - d. Punched or drilled for mechanical fasteners with 1/4 inch grommets in corners for mounting.
  - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless steel screws or stainless steel machine screws with nuts and flat and lock washers.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

#### 3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Verify identity of item before installing identification products.
- C. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- D. Apply identification devices to surfaces that require finish after completing finish work.
- E. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- F. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from floor.
- G. Self-Adhesive Labels:
  - 1. Install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
  - 2. Unless otherwise indicated, provide single line of text with 1/2 inch high letters on 1-1/2 inch high label; where two lines of text are required, use labels 2 inch high.
- H. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's instructions.
- I. Baked-Enamel Signs:
  - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
  - 2. Unless otherwise indicated, provide single line of text with 1/2 inch high letters on minimum 1-1/2 inch high sign; where two lines of text are required, use signs minimum 2 inch high.
- J. Metal-Backed Butyrate Signs:
  - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
  - 2. Unless otherwise indicated, provide single line of text with 1/2 inch high letters on 1-1/2 inch high sign; where two lines of text are required, use labels 2 inch high.
- K. Laminated Acrylic or Melamine Plastic Signs:

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1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
2. Unless otherwise indicated, provide single line of text with 1/2 inch high letters on 1-1/2 inch high sign; where two lines of text are required, use labels 2 inch high.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in direction of access to live parts. Workspace must comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- C. Instructional Signs: Self-adhesive labels, including color code for grounded and ungrounded conductors.
- D. Equipment Identification Labels:
  1. Indoor Equipment: Self-adhesive label.
  2. Outdoor Equipment: Laminated acrylic or melamine sign.

END OF SECTION

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Lighting and appliance branch-circuit panelboards.
  - 2. Disconnecting and overcurrent protective devices.

1.2 DEFINITIONS

- A. GFEP: Ground-fault equipment protection.
- B. VPR: Voltage protection rating.

1.3 ACTION SUBMITTALS

- A. Product Data:
  - 1. Lighting and appliance branch-circuit panelboards.
  - 2. Load centers.
  - 3. Disconnecting and overcurrent protective devices.
  - 4. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
  - 5. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Include dimensioned plans, elevations, sections, and details.
  - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
  - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
  - 4. Detail bus configuration, current, and voltage ratings.
  - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
  - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- C. Field Quality-Control Submittals:
  - 1. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

- A. Warranty documentation.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Special Tools: Furnish to Owner proprietary equipment, keys, and software required to operate, maintain, repair, adjust, or implement future changes to panelboards, that are packaged with protective covering for storage on-site and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing agency recognized by authorities having jurisdiction, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.
- D. Enclosures: Flush and Surface-mounted, dead-front cabinets.
  - 1. Rated for environmental conditions at installed location.
    - a. Indoor Dry and Clean Locations: UL 50E, Type 1.
    - b. Outdoor Locations: UL 50E, Type 3R.
  - 2. Height: 7 ft maximum.
  - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims must cover live parts and may have no exposed hardware.
- E. Phase, Neutral, and Ground Buses:
  - 1. Material: Hard-drawn copper, 98 percent conductivity.
- F. Conductor Connectors: Suitable for use with conductor material and sizes.
  - 1. Material: Hard-drawn copper, 98 percent conductivity.
  - 2. Main and Neutral Lugs: Mechanical type, with lug on neutral bar for each pole in panelboard.
  - 3. Ground Lugs and Bus-Configured Terminators: Mechanical type, with lug on bar for each pole in panelboard.
- G. Quality-Control Label: Panelboards or load centers must be labeled, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers must have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.

- H. Panelboard Short-Circuit Current Rating:
  - 1. Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for 100 percent interrupting capacity.

## 2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ABB, Electrification Business.
  - 2. Eaton.
  - 3. Siemens Industry, Inc., Energy Management Division.
  - 4. Square D; Schneider Electric USA.
- B. Listing Criteria: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.

## 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ABB, Electrification Business.
  - 2. Eaton.
  - 3. Siemens Industry, Inc., Energy Management Division.
  - 4. Square D; Schneider Electric USA.
- B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers:
    - a. Inverse time-current element for low-level overloads.
    - b. Instantaneous magnetic trip element for short circuits.
    - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6 mA trip).
  - 3. GFEP Circuit Breakers: Class B ground-fault protection (30 mA trip).
  - 4. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240 V, single-pole configuration.
  - 5. Subfeed Circuit Breakers: Vertically mounted.
  - 6. MCCB Features and Accessories:
    - a. Standard frame sizes, trip ratings, and number of poles.
    - b. Breaker handle indicates tripped status.
    - c. UL listed for reverse connection without restrictive line or load ratings.
    - d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    - e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
    - f. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with manufacturer's published instructions.
- B. Reference Standards:
  - 1. Panelboards: Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NECA 407.
  - 2. Consult Architect for resolution of conflicting requirements.
- C. Special Techniques:
  - 1. Mount panelboard cabinet plumb and rigid without distortion of box.
  - 2. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
  - 3. Install overcurrent protective devices and controllers not already factory installed.
  - 4. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
  - 5. Install filler plates in unused spaces.

### 3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."
- B. Panelboard Nameplates: Label each panelboard with nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- C. Device Nameplates: Label each branch circuit device in power panelboards with nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- D. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.
- E. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles must be located on interior of panelboard door.
- F. Breaker Labels: Faceplate must list current rating, UL and IEC certification standards, and AIC rating.
- G. Circuit Directory:
  - 1. Provide computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
    - a. Circuit directory must identify specific purpose with detail sufficient to distinguish it from other circuits.

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2. Create directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

C. Nonconforming Work:

1. Panelboards will be considered defective if they do not pass tests and inspections.
2. Remove and replace defective units and retest.

D. Collect, assemble, and submit test and inspection reports, including certified report that identifies panelboards included and that describes scanning results, with comparisons of two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION

SECTION 262726

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General-use switches, dimmer switches, and fan-speed controller switches.
2. General-grade single straight-blade receptacles.
3. General-grade duplex straight-blade receptacles.
4. Hospital-grade straight-blade receptacles.
5. Receptacles with arc-fault and ground-fault protective devices.
6. Locking receptacles.
7. Pin-and-sleeve receptacles.
8. Special-purpose power outlet assemblies.
9. Connectors, cords, and plugs.

1.2 ACTION SUBMITTALS

A. Product Data:

1. General-use switches, dimmer switches, and fan-speed controller switches.
2. General-grade single straight-blade receptacles.
3. General-grade duplex straight-blade receptacles.
4. Receptacles with arc-fault and ground-fault protective devices.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Special Tools:

1. Proprietary equipment and software required to maintain, repair, adjust, or implement future changes to controlled receptacles.
2. Proprietary equipment required to maintain, repair, adjust, or implement future changes to cord connectors.

PART 2 - PRODUCTS

2.1 GENERAL-USE SWITCHES, DIMMER SWITCHES, AND FAN-SPEED CONTROLLER SWITCHES

A. Toggle Switch:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

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- a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Pass & Seymour; Legrand North America, LLC.
2. Regulatory Requirements:
- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
3. General Characteristics:
- a. Reference Standards: UL CCN WMUZ and UL 20.
4. Options:
- a. Device Color: White.
  - b. Configuration:
    - 1) General-duty, 120-277 V, 15 A, single pole.
5. Accessories:
- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

2.2 GENERAL-GRADE SINGLE STRAIGHT-BLADE RECEPTACLES

A. Single Straight-Blade Receptacle:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Pass & Seymour; Legrand North America, LLC.
2. Regulatory Requirements:
  - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
3. General Characteristics:
  - a. Reference Standards: UL CCN RTRT and UL 498.
4. Options:
  - a. Device Color: White.
  - b. Configurations:

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- 1) General-duty, NEMA 5-15R, NEMA 5-20R.
- 2) Heavy-duty, NEMA 14-30R (Dryer), NEMA 14-50R (Range).

5. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

2.3 GENERAL-GRADE DUPLEX STRAIGHT-BLADE RECEPTACLES

A. Duplex Straight-Blade Receptacle:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Pass & Seymour; Legrand North America, LLC.
2. Regulatory Requirements:
  - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
3. General Characteristics:
  - a. Reference Standards: UL CCN RTRT and UL 498.
4. Options:
  - a. Device Color: White.
  - b. Configuration:
    - 1) Heavy-duty, NEMA 5-15R, NEMA 5-20R.
5. Accessories:
  - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

B. Tamper-Resistant Duplex Straight-Blade Receptacle:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
  - b. Pass & Seymour; Legrand North America, LLC.
2. Regulatory Requirements:

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- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
- 3. General Characteristics:
  - a. Reference Standards: UL CCN RTRT and UL 498.
- 4. Options:
  - a. Device Color: White.
  - b. Configuration:
    - 1) Heavy-duty, NEMA 5-15R NEMA 5-20R.
- 5. Accessories:
  - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

2.4 RECEPTACLES WITH ARC-FAULT AND GROUND-FAULT PROTECTIVE DEVICES

- A. General-Grade, Weather-Resistant, Tamper-Resistant Duplex Straight-Blade Receptacle with GFCI Device:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
    - b. Pass & Seymour; Legrand North America, LLC.
  - 2. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 3. General Characteristics:
    - a. Reference Standards: UL CCN KCXS, UL 498, and UL 943.
  - 4. Options:
    - a. Device Color: White.
    - b. Configuration: Heavy-duty, NEMA 5-15R, NEMA 5-20R.
  - 5. Accessories:
    - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
    - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Receptacles:

1. Verify that receptacles to be procured and installed for Owner-furnished equipment are compatible with mating attachment plugs on equipment.

### 3.2 INSTALLATION OF SWITCHES

#### A. Comply with manufacturer's instructions.

#### B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Consult Architect for resolution of conflicting requirements.

### 3.3 INSTALLATION OF STRAIGHT-BLADE RECEPTACLES

#### A. Comply with manufacturer's instructions.

#### B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.
4. Consult Architect for resolution of conflicting requirements.

### 3.4 FIELD QUALITY CONTROL OF SWITCHES

#### A. Tests and Inspections:

1. Perform tests and inspections in accordance with manufacturers' instructions.

#### B. Nonconforming Work:

1. Unit will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

#### C. Assemble and submit test and inspection reports.

3.5 FIELD QUALITY CONTROL OF STRAIGHT-BLADE RECEPTACLES

A. Tests and Inspections:

1. Insert and remove test plug to verify that device is securely mounted.
2. Verify polarity of hot and neutral pins.
3. Measure line voltage.
4. Measure percent voltage drop.
5. Measure grounding circuit continuity; impedance must be not greater than 2 ohms.
6. Perform additional installation and maintenance inspections and diagnostic tests in accordance with NECA NEIS 130 and manufacturers' instructions.

B. Nonconforming Work:

1. Device will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

C. Assemble and submit test and inspection reports.

3.6 PROTECTION

A. Devices:

1. Schedule and sequence installation to minimize risk of contamination of wires and cables, devices, device boxes, outlet boxes, covers, and cover plates by plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other materials.
2. After installation, protect wires and cables, devices, device boxes, outlet boxes, covers, and cover plates from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

SECTION 284621.13

CONVENTIONAL FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Heat detectors.
- B. Related Requirements:
  - 1. Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for cables and conductors for fire-alarm systems.

1.2 ACTION SUBMITTALS

- A. General Submittal Requirements:
  - 1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
  - 2. Shop Drawings shall be prepared by persons with the following qualifications:
    - a. Trained and certified by manufacturer in fire-alarm system design.
    - b. NICET-certified fire-alarm technician; Level III minimum.
    - c. Licensed or certified by authorities having jurisdiction.
- B. Product Data: For each type of product, including furnished options and accessories.
- C. Shop Drawings: For fire-alarm system.
  - 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
  - 2. Include plans, elevations, sections, details, and attachments to other work.
  - 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
  - 4. Detail assembly and support requirements.
  - 5. Include voltage drop calculations for notification-appliance circuits.
  - 6. Include battery size calculations.
  - 7. Include input/output matrix.
  - 8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
  - 9. Include performance parameters and installation details for each detector.
  - 10. Verify that each duct smoke detector is listed for the complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
  - 11. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.

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CONVENTIONAL FIRE-ALARM SYSTEMS

- a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
  - b. Show field wiring required for HVAC unit shutdown on alarm.
  - c. Locate detectors according to manufacturer's written recommendations.
12. Include floor plans to indicate final outlet locations showing zone designation of each device. Show size and route of cable and conduits and point-to-point wiring diagrams.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
- a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - b. Provide the "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
  - c. Complete wiring diagrams showing connections between all devices and equipment.
  - d. Riser diagram.
  - e. Record copy of site-specific software.
  - f. Provide the "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
    - 1) Equipment tested.
    - 2) Frequency of testing of installed components.
    - 3) Frequency of inspection of installed components.
    - 4) Requirements and recommendations related to results of maintenance.
    - 5) Manufacturer's user training manuals.
  - g. Manufacturer's required maintenance related to system warranty requirements.
  - h. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
- 1. Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
  - 2. Installation shall be by personnel certified by NICET as fire-alarm Level II technician.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with and operate as an extension of existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded system dedicated to fire-alarm service only.
- C. All components provided shall be listed for use with the selected system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### 2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices:
  - 1. Heat detectors.
- B. Fire-alarm signal shall initiate the following actions:
  - 1. Continuously operate alarm notification appliances.
  - 2. Identify alarm zone at fire-alarm control unit.
  - 3. Transmit an alarm signal to the remote alarm receiving station.
  - 4. Record events in the system memory.
- C. System trouble signal initiation shall be by one or more of the following devices and actions:
  - 1. Open circuits, shorts, and grounds in designated circuits.
  - 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
- D. System Trouble and Supervisory Signal Actions:
  - 1. Initiate notification appliances.
  - 2. Annunciate at fire-alarm control unit.
  - 3. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.

### 2.3 HEAT DETECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Fire-Lite Alarms; Honeywell International, Inc.
  - 2. System Sensor; Honeywell International, Inc.
- B. General Requirements for Heat Detectors: Comply with UL 521.
- C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature.

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CONVENTIONAL FIRE-ALARM SYSTEMS

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.

### PART 3 - EXECUTION

#### 3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
- B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
- C. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- D. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- E. Device Location-Indicating Lights: Locate in public space near the device they monitor.

#### 3.2 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
  1. Exposed pathways shall be installed in EMT.
- B. Exposed EMT shall be painted red enamel.

#### 3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

#### 3.4 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

#### 3.5 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction.

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CONVENTIONAL FIRE-ALARM SYSTEMS

B. Perform the following tests and inspections:

1. Visual Inspection: Conduct the visual inspection prior to testing.
  - a. Inspection shall be based on completed record Drawings and system documentation that is required by NFPA 72 in Chapter 10 "Fundamentals," Section 10.18.21 "Completion Documents, Preparation."
  - b. Comply with NFPA 72, Chapter 14, "Inspection, Testing, and Maintenance," Section 14.3 "Inspection" and the "Visual Inspection Frequencies" Table; retain the "Initial/Reacceptance" column and list only the installed components.
2. System Testing: Comply with NFPA 72, Chapter 14, "Inspection, Testing, and Maintenance," Section 14.4 "Testing" and the "Test Methods" Table.
3. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

D. Fire-alarm system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

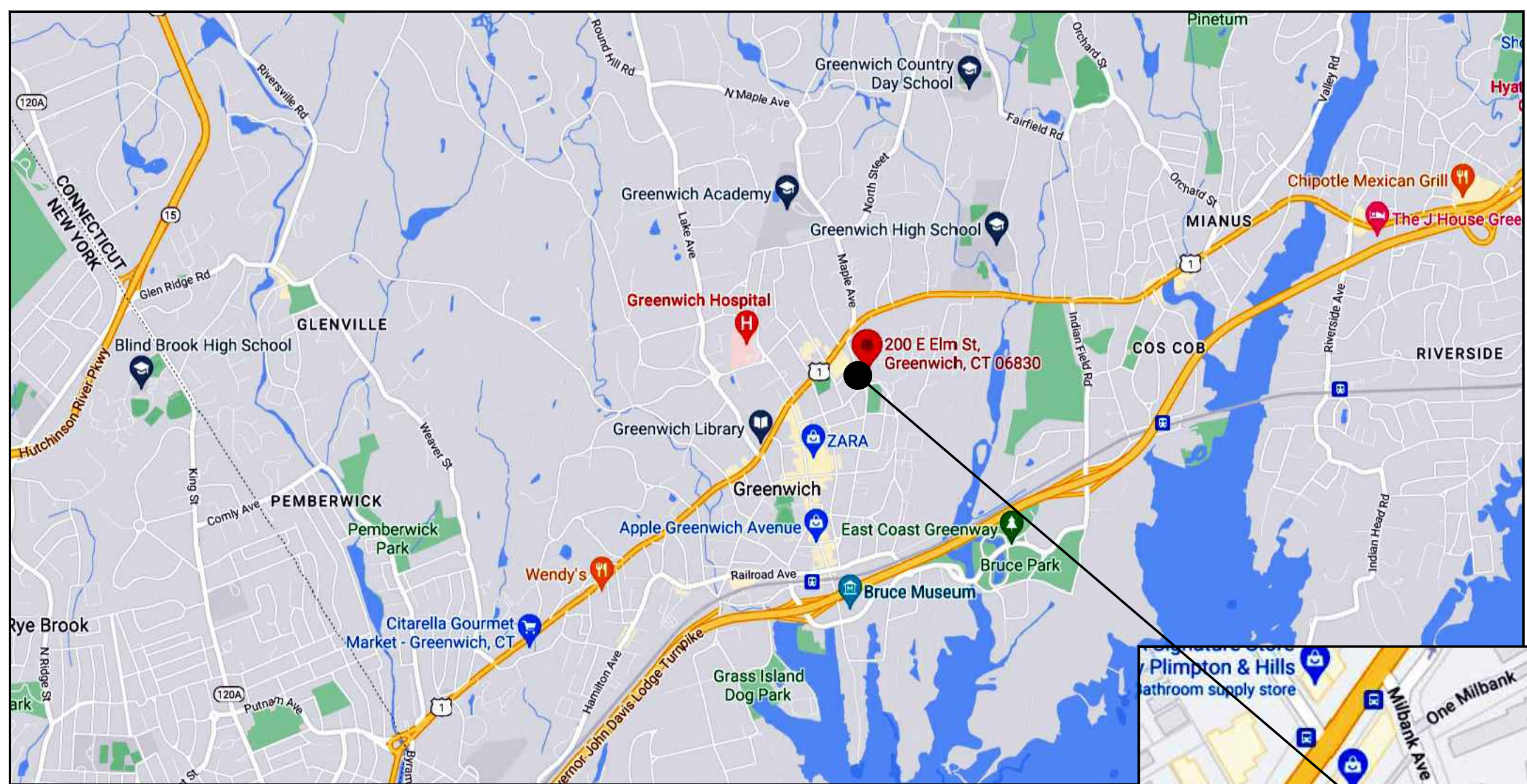
END OF SECTION

# LIFE SKILLS ROOM and RELATED WORK

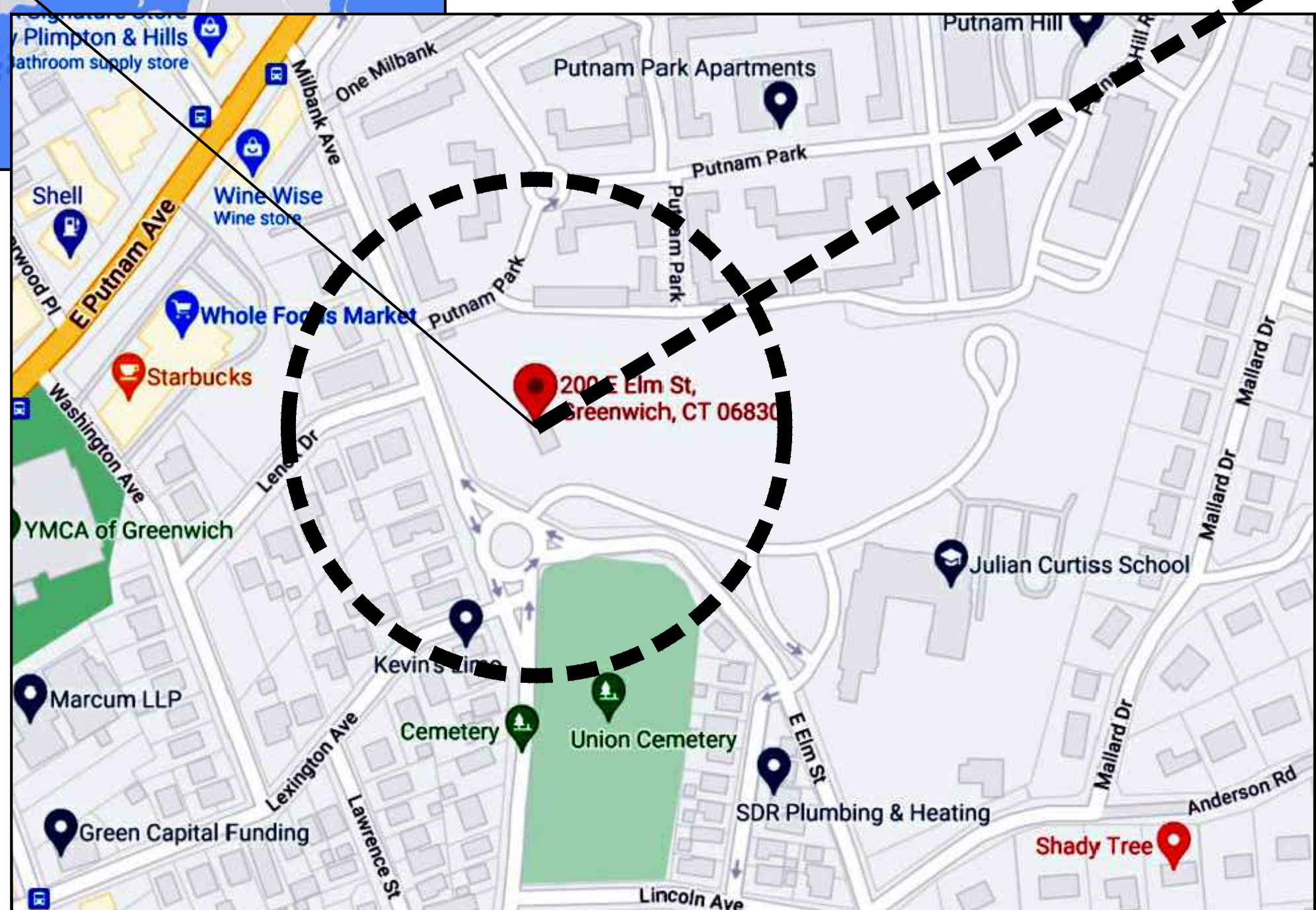
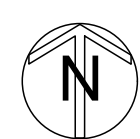
## MILBANK SCHOOL

200 EAST ELM STREET, GREENWICH, CT 06830

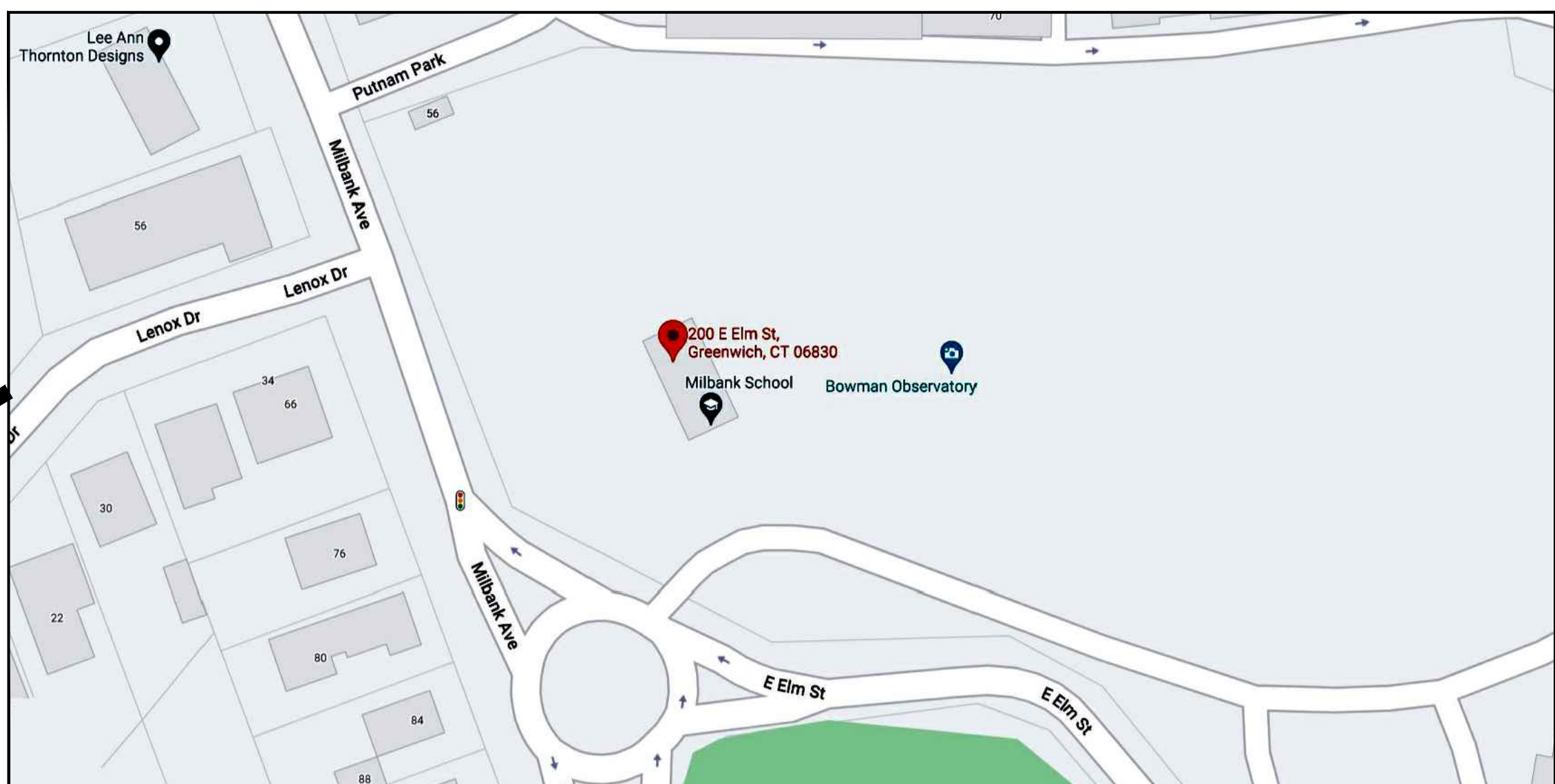
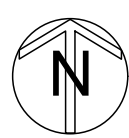
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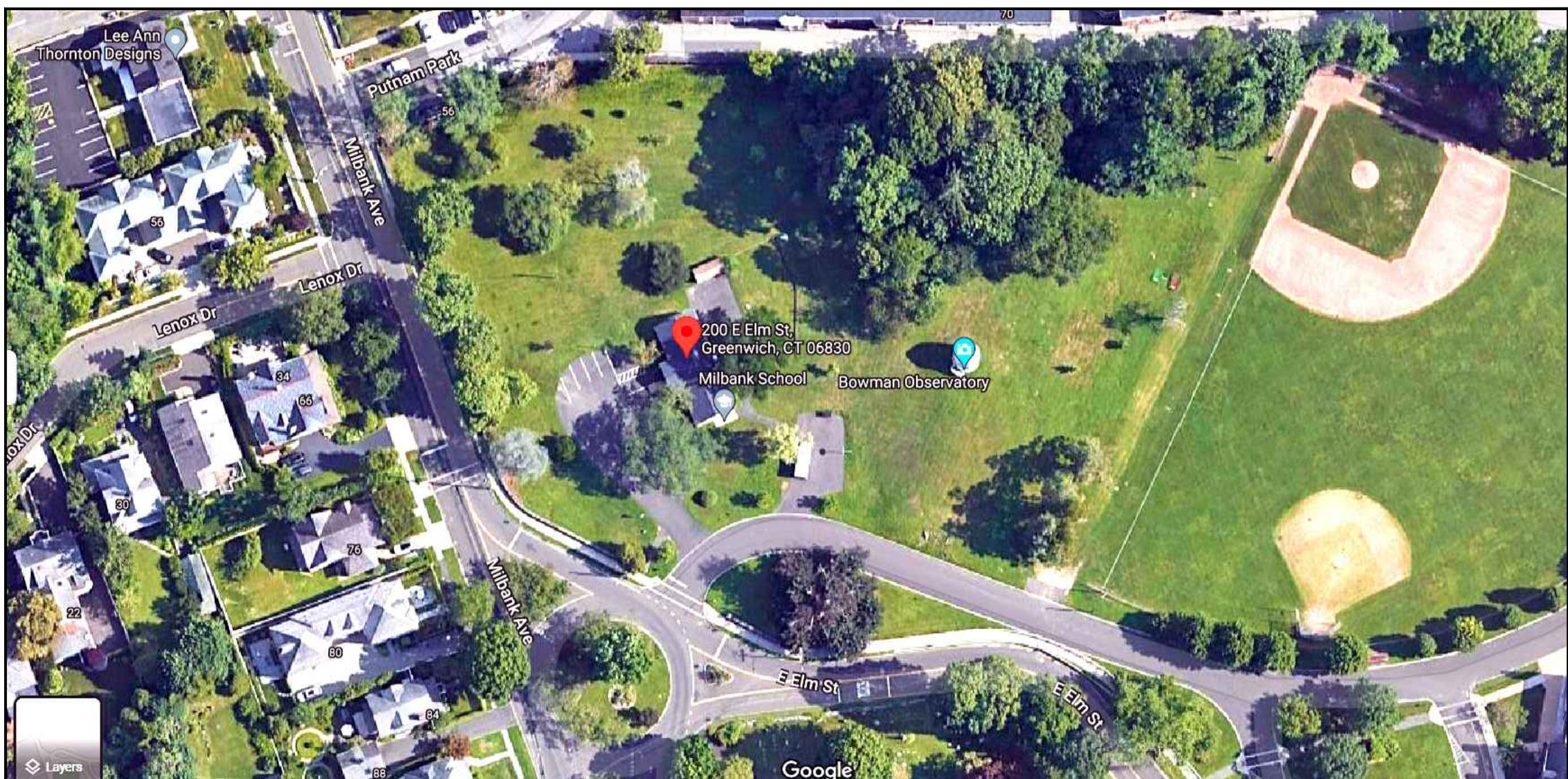
REGIONAL MAP  
NOT TO SCALE



VICINITY MAP  
NOT TO SCALE



SITE  
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AERIAL VIEW  
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### CONSULTANTS:

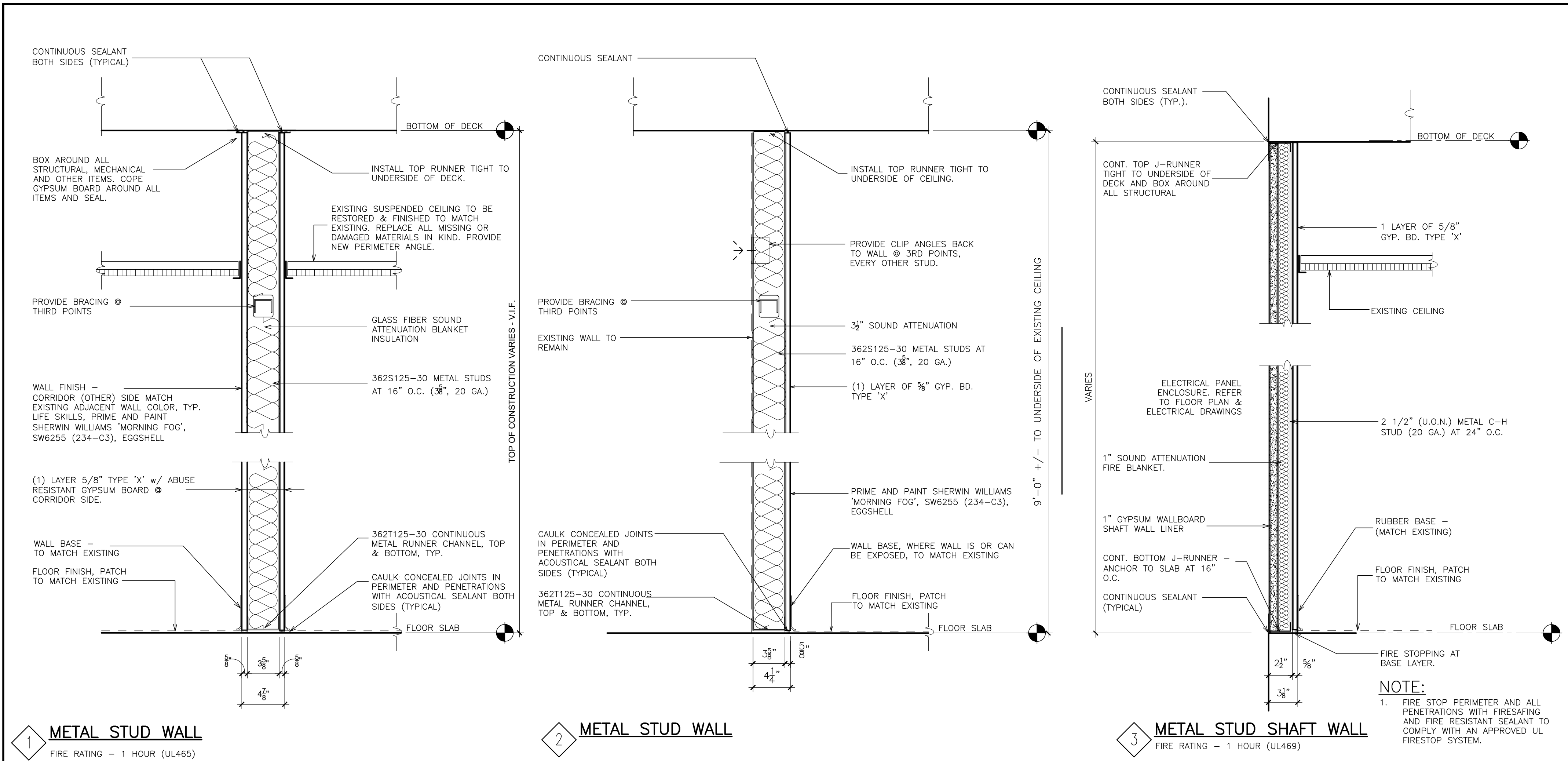
ENGINEERING SERVICES  
(MECHANICAL, ELECTRICAL, PLUMBING)

LANDMARK FACILITIES GROUP, Inc.

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NORWAL, CT 06855  
TEL: 203.866.4626  
FAX: 203.866.8019

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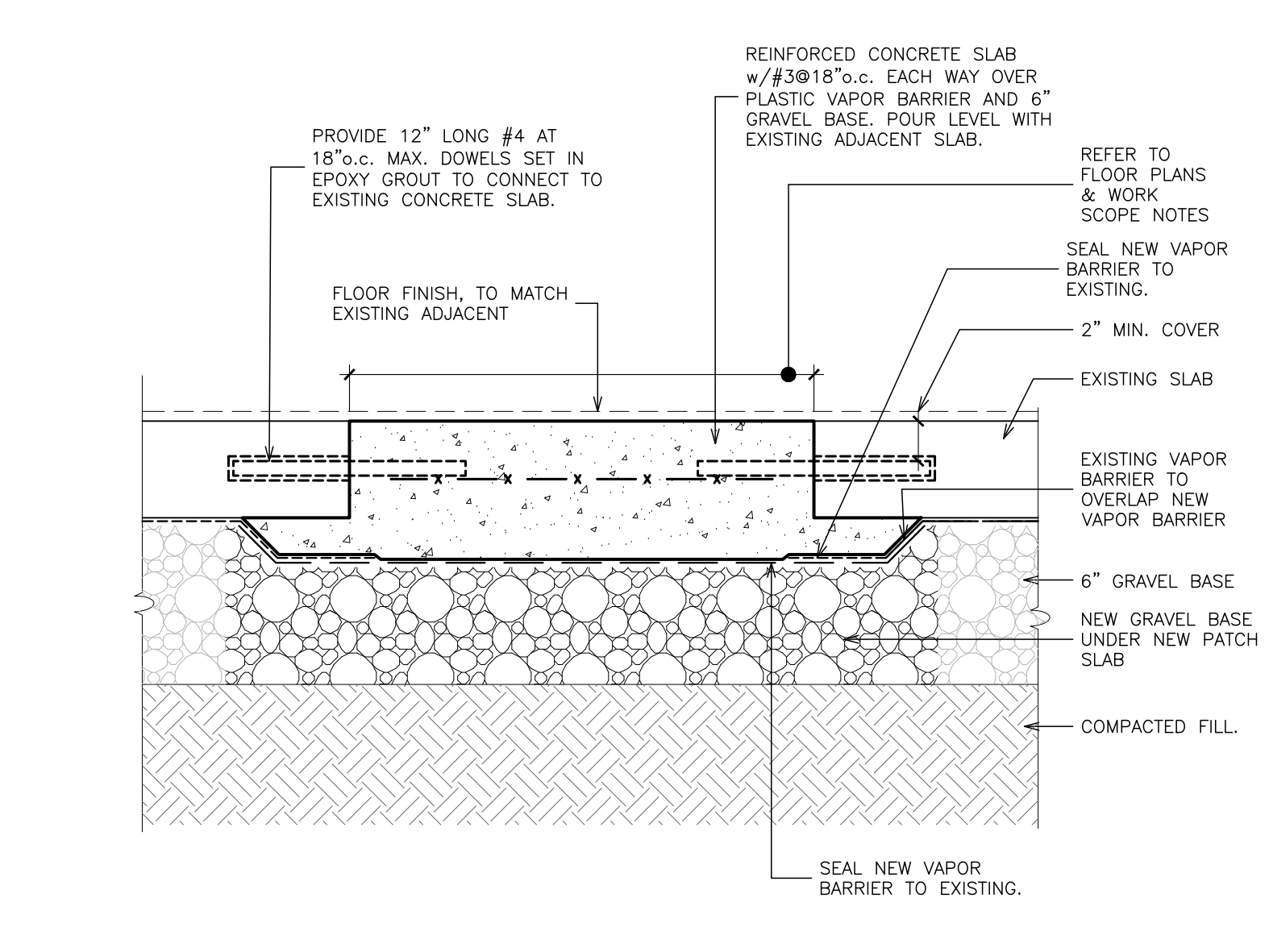
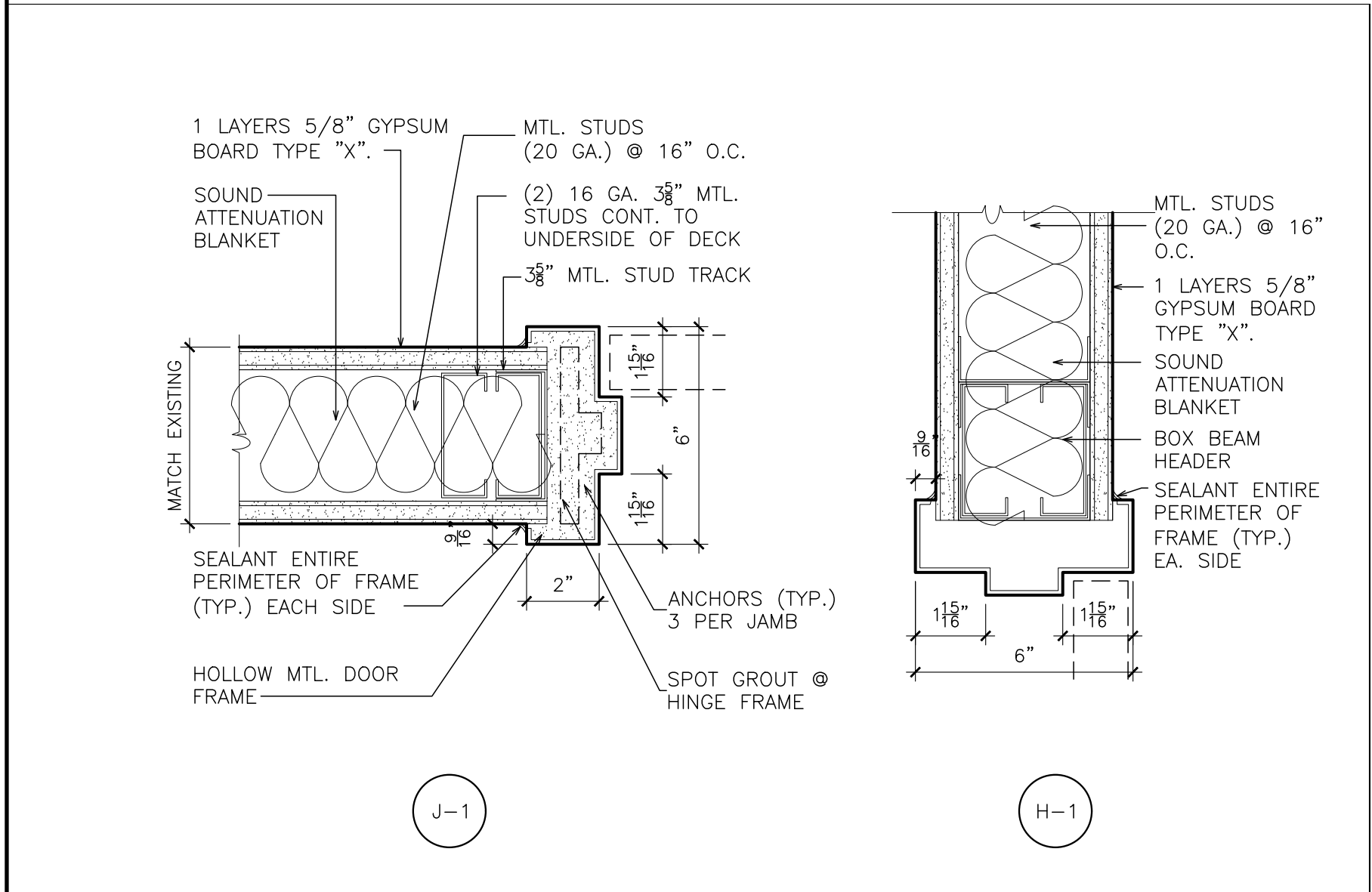




1 METAL STUD WALL  
FIRE RATING - 1 HOUR (UL465)

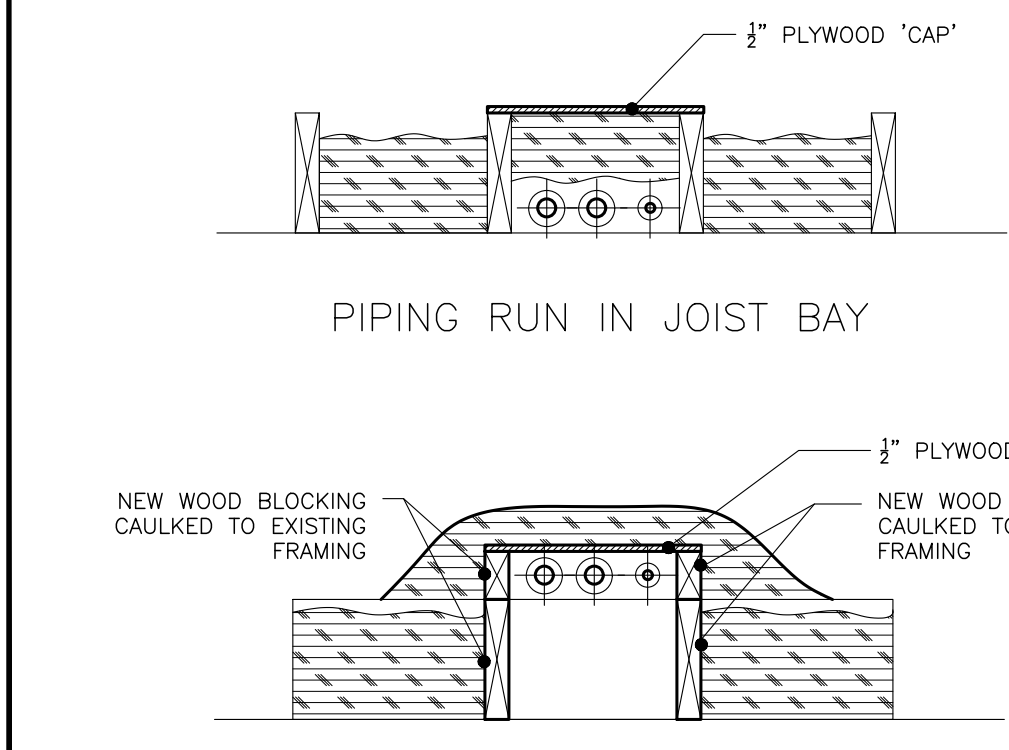
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FIRE RATING - 1 HOUR (UL465)

3 METAL STUD SHAFT WALL  
FIRE RATING - 1 HOUR (UL469)



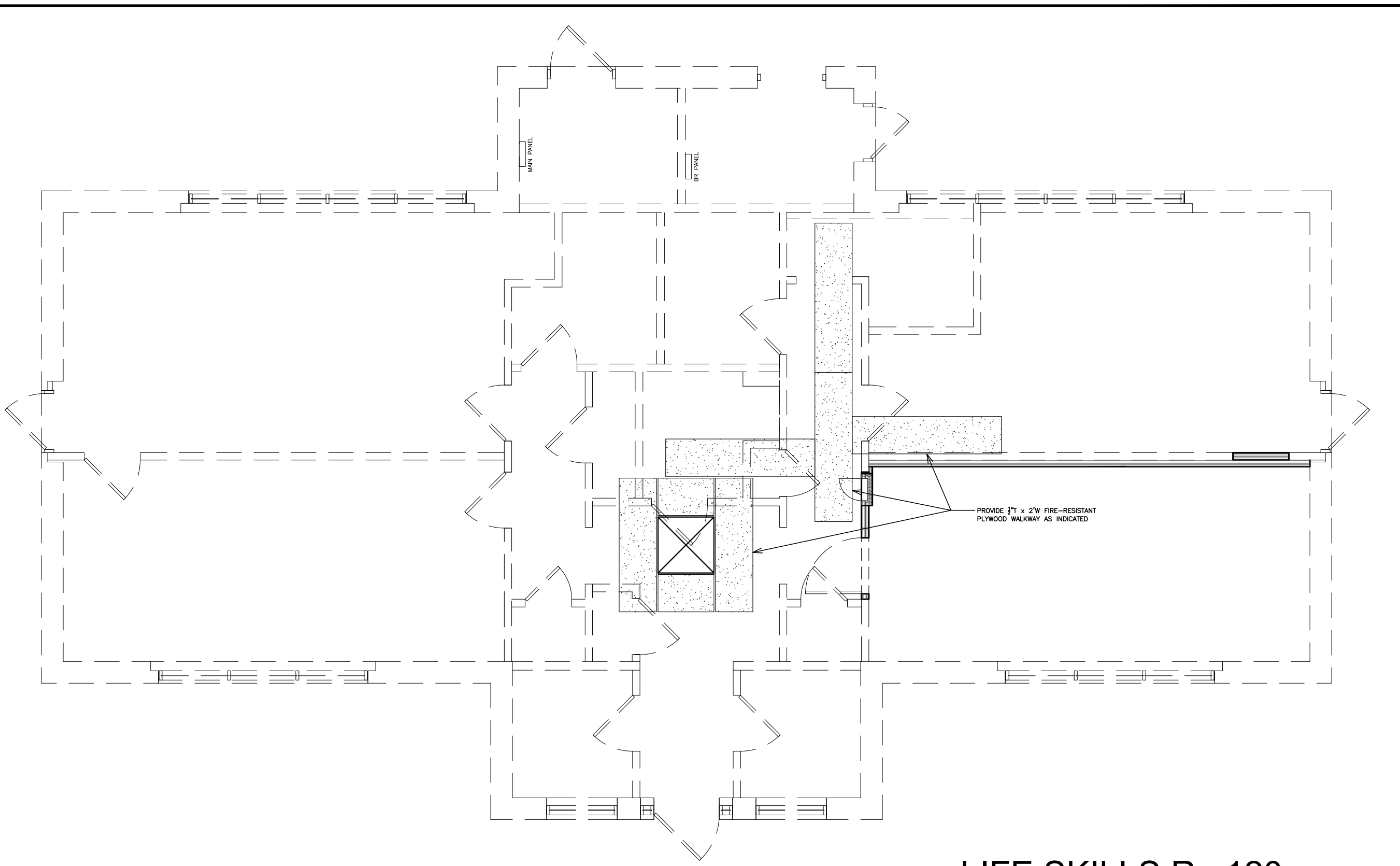
4 DETAIL - SLAB ON GRADE  
SCALE: N.T.S.

FINISH SCHEDULE LEGEND					
LEGEND	SIZE	MANUFACTURER	SERIES/MODEL NO. / COLOR	DESCRIPTION	LOCATION / REMARKS
P-1	-	SHERWIN WILLIAMS	SW 6255 / MORNING FOG	EGGSHELL PAINT	LIFE SKILLS - CLASSROOM 120
P-2	-	SHERWIN WILLIAMS	MATCH EXISTING	SEMI-GLOSS DOOR FRAMES	DOOR FRAMES (TO MATCH SCHOOL STANDARD)
RB-1	4" HIGH	JOHNSONITE	BLACK	RUBBER BASE	CLASSROOM (TO MATCH SCHOOL STANDARD)
CAB-1	-	WILSONART	17012K-57 / MERCER OAK	CABINET LAMINATE	CLASSROOM
EDGE-1	-	WILSONART	MATCH CABINET LAMINATE	3MM PVC EDGE BANDING	CLASSROOM (EASE ALL EDGES)
COT-1	-	WILSONART	LYRA / Q2001	QUARTZ COUNTERTOP	CLASSROOM

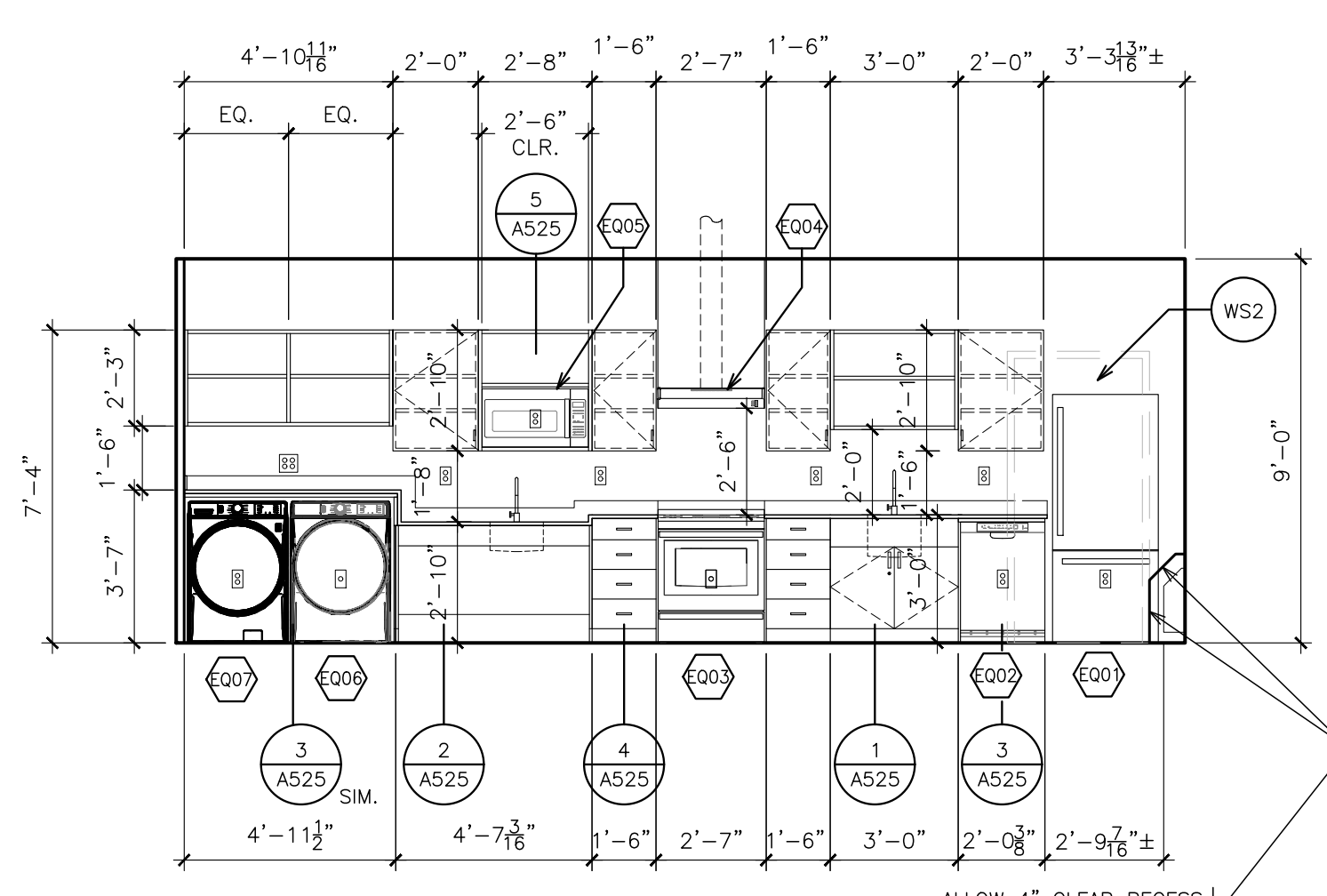


5 DETAIL - PIPE INSULATION ATTIC  
SCALE: N.T.S.

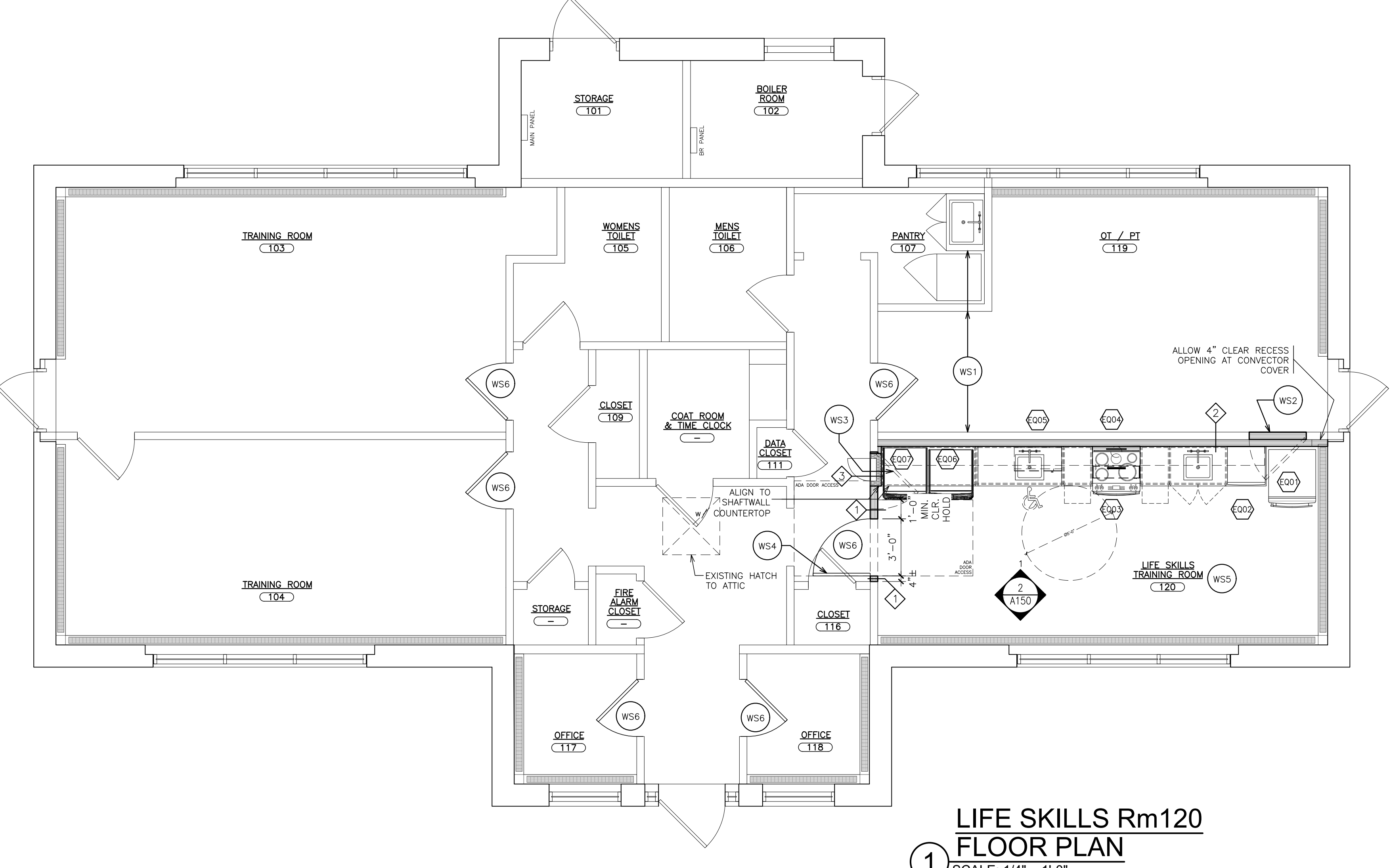
EQUIPMENT SCHEDULE:				
MANUFACTURER	DESCRIPTION	MODEL NUMBER	DIMENSIONS	POWER RATINGS
E001 GE	21.0 CU. FT. BOTTOM-FREEZER REFRIGERATOR	GDE21EYKFS	69 1/2"H x 29 1/2"W x 36 1/2"D	120V; 60HZ; 15A
E002 GE	FRONT CONTROL WITH STAINLESS STEEL INTERIOR DISHWASHER WITH SANITIZE CYCLE & DRY BOOST	GDF645SSNSS	34"H x 24 1/2"W x 24"D	120V; 60HZ; 6.6A 800 / 500 CALROD HEATER WATTS
E003 GE	PROFILE, 30" SMART SLIDE-IN FINGERPRINT RESISTANT FRONT-CONTROL INDUCTION AND CONVECTION RANGE WITH NO PREHEAT AIR FRY	PHS930YFSS	37 1/4"H x 29 1/2"W x 28 1/2"D	208V / 240V; 40A / 40A KW RATING 208V: 10.4 KW RATING 240V: 12.5 BAKE WATTAGE: 2850W BROILER WATTAGE: 4000W CONVECTION WATTAGE: 2500W
E004 GE	30" UNDER THE CABINET HOOD CHARCOAL FILTER POWER CORD KIT (STD 3-PRONG CONVERSION)	JVKX5305JSS JXCFS5 JXHC1	52 1/2"H x 29 1/2"W x 20"D	120V, 1.0A
E005 GE	1.7 CU. FT. OVER-THE-RANGE SENSOR MICROWAVE OVEN (RECIRCULATING (NON-VENTED DUCTLESS))	JVM6175YKFS	16 1/8"H x 29 1/2"W x 15 1/8"D	120V; 60HZ; 15A 1580W
E006 GE	7.8 CU. FT. CAPACITY SMART FRONT LOAD ELECTRIC DRYER WITH SANITIZE CYCLE	GFD55ESPNDG	39 1/2"H x 28 1/2"W x 32"D	120V/240V, 5600W, 24A, 60HZ OR 120V/208V, 4400W, 22A, 60HZ
E007 GE	4.8 CU. FT. CAPACITY SMART FRONT LOAD WASHER W/ ODOBLOCK ULTRAFRESH VENT SYSTEM AND SANITIZE W/OXI	GFWS50SPNDG	39 1/2"H x 28 1/2"W x 32"D	120V; 60HZ; 15A CIRCUIT BREAKER OR 20A TIME DELAY FUSE



LIFE SKILLS Rm120  
ATTIC PLAN  
SCALE: 3/16" = 1'-0"



LIFE SKILLS Rm120  
ELEVATION  
SCALE: 1/4" = 1'-0"



LIFE SKILLS Rm120  
FLOOR PLAN  
SCALE: 1/4" = 1'-0"

- NOTES:
- COORDINATE DIMENSIONS, UTILITY'S AND LAYOUT PLAN WITH APPROVED EQUIPMENT SHOP DRAWINGS AND MEP DRAWINGS & SPECIFICATIONS.
  - ALL EXPOSED-TO-VIEW CASEWORK SHALL BE FINISHED. REFER TO DETAILS AND SPECIFICATIONS.

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ELMHURST NEW YORK 10883  
TEL 914.899.4444 FAX 914.899.1917  
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PROJECT: LIFE SKILLS ROOM and RELATED WORK  
SCHOOL: MILBANK SCHOOL  
200 EAST ELM STREET, GREENWICH, CT 06830  
DRAWING TITLE: BUILDING FLOOR PLAN & INTERIOR ELEVATION - LIFE SKILLS TRAINING ROOM #120 AND DETAILS

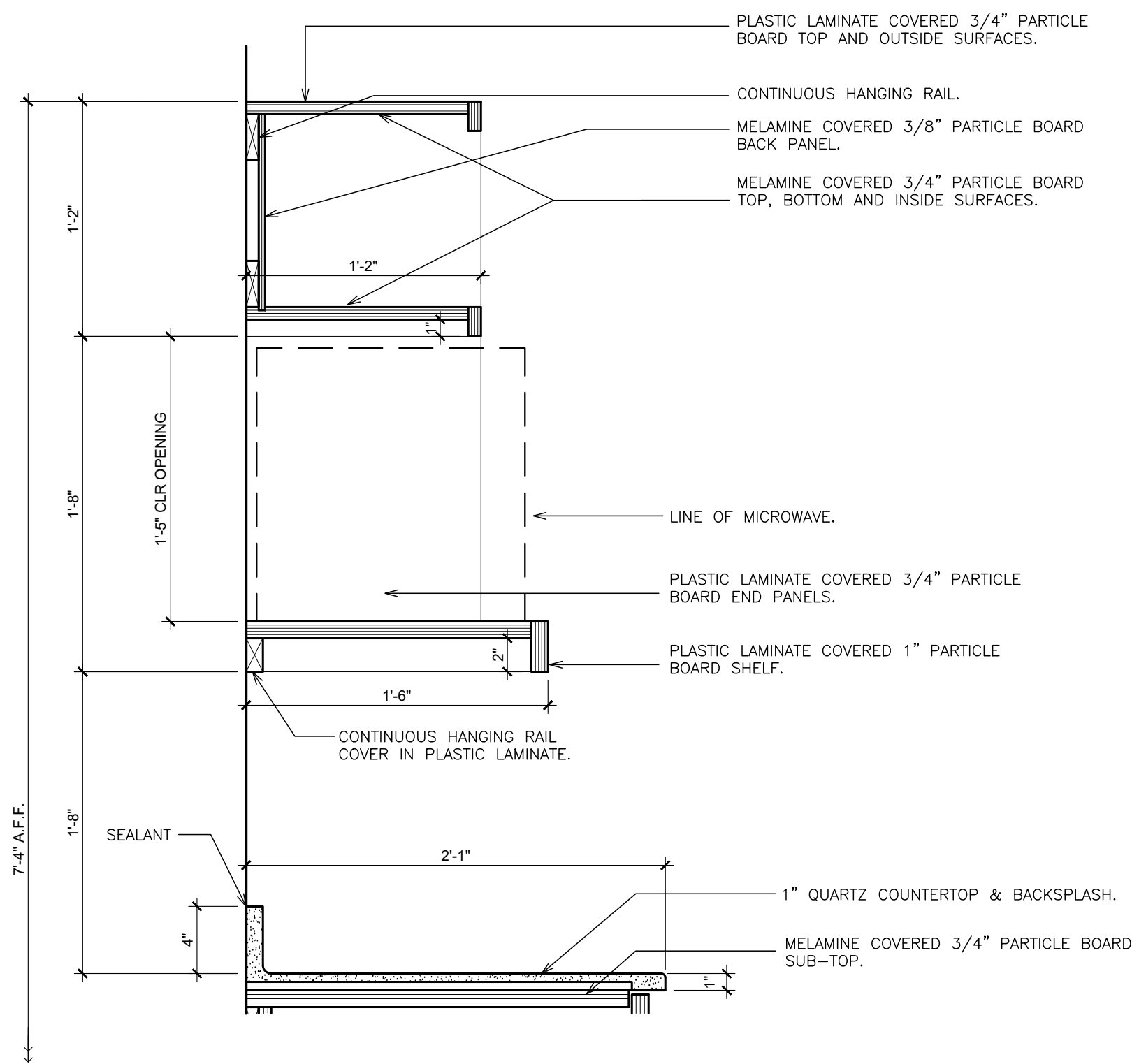
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FILE NO.: 22495.00

PLOT DATE: February 13, 2023 — 9:16am

FILE: I:\22495.00 GPS Millbank—Life Skills\DRAWINGS\CURRENT\1—F&D\A525.dwg

## 5 DETAIL- WALL SHELF @ MICROWAVE

SCALE: 1 1/2" = 1'-0"

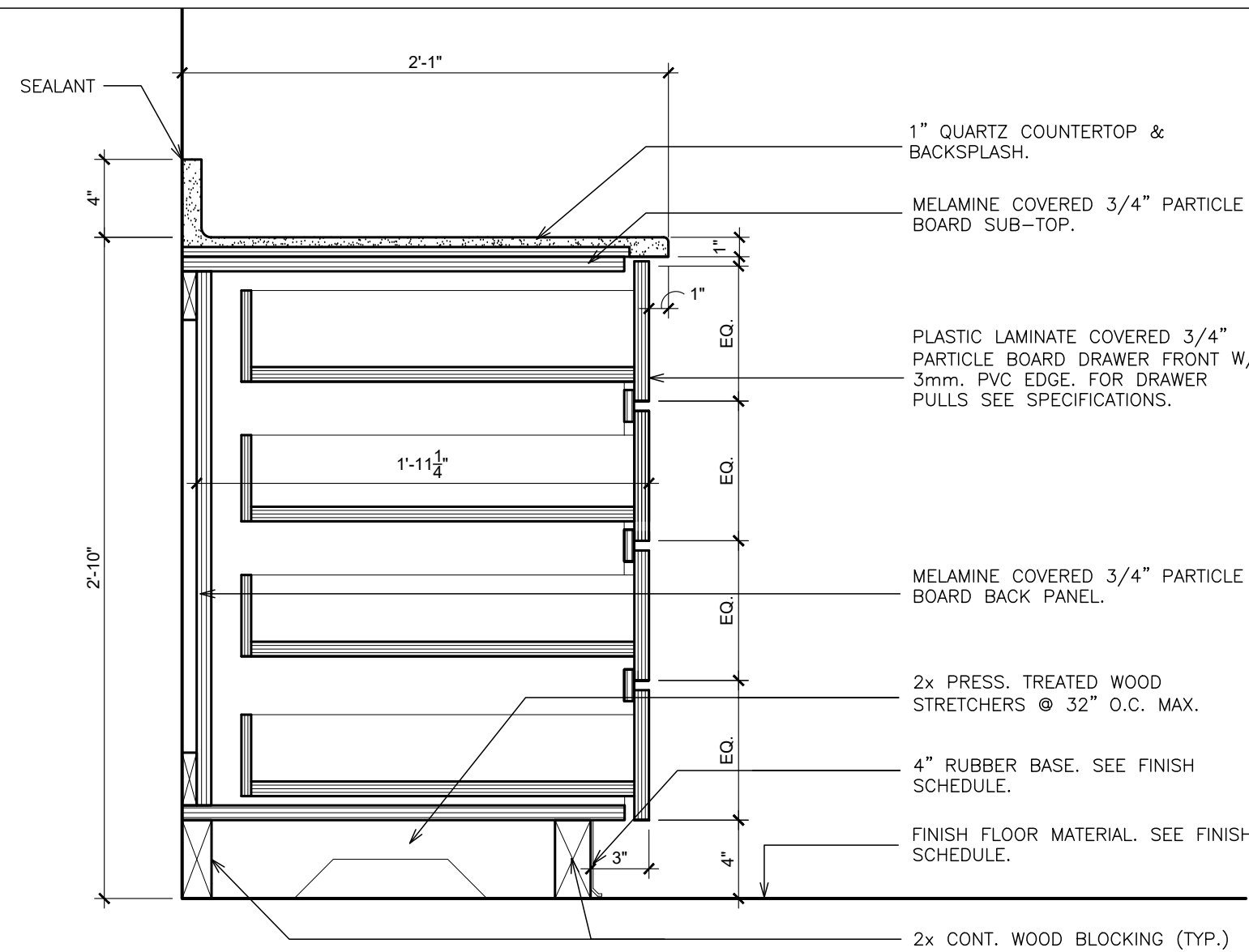


### LAMINATE CASE WORK NOTES:

1. PLASTIC LAMINATE FINISH ON ALL EXPOSED TO VIEW INTERIOR AND EXTERIOR SURFACES.
2. PROVIDE BLOCKING AS REQUIRED TO SUPPORT CASEWORK ON ALL DRYWALL PARTITIONS AND WALLS. PROVIDE CONCEALED SOLID BLOCKING WHERE CASEWORK ABUTS NEW CONSTRUCTION (OR FURRING). WOOD BLOCKING SHALL BE FIRE RETARDANT.
3. SEE FINISH SCHEDULE FOR COLORS / FINISHES.
4. HEIGHT DIMENSIONS SHOWN ON ELEVATIONS INCLUDE COUNTERTOP.
5. ALL DIMENSIONS AND WALL CONDITIONS ARE TO BE FIELD VERIFIED. (COLUMNS, WINDOWS, DOOR JAMBS, ETC.).
6. SEE SPECIFICATIONS SECTION "JOINT SEALANT" FOR SEALANT APPLICATIONS.
7. COORDINATE SPACE REQUIREMENTS FOR PLUMBING, ELECTRICAL, AND MECHANICAL ELEMENTS.
8. PROVIDE CABINET LOCKS AT ALL CABINETS AND DRAWERS. COORDINATE KEYING WITH OWNER.
9. ALL CABINETS SHALL BE SECURED / SECURELY INSTALLED AT ALL TIMES.
10. ALL CASEWORK SHALL BE PROTECTED WITH PLASTIC AND MASONITE BY CONSTRUCTION CONTRACTOR TO PREVENT ACCIDENTAL DAMAGE UNTIL FINAL TURNOVER TO OWNER.

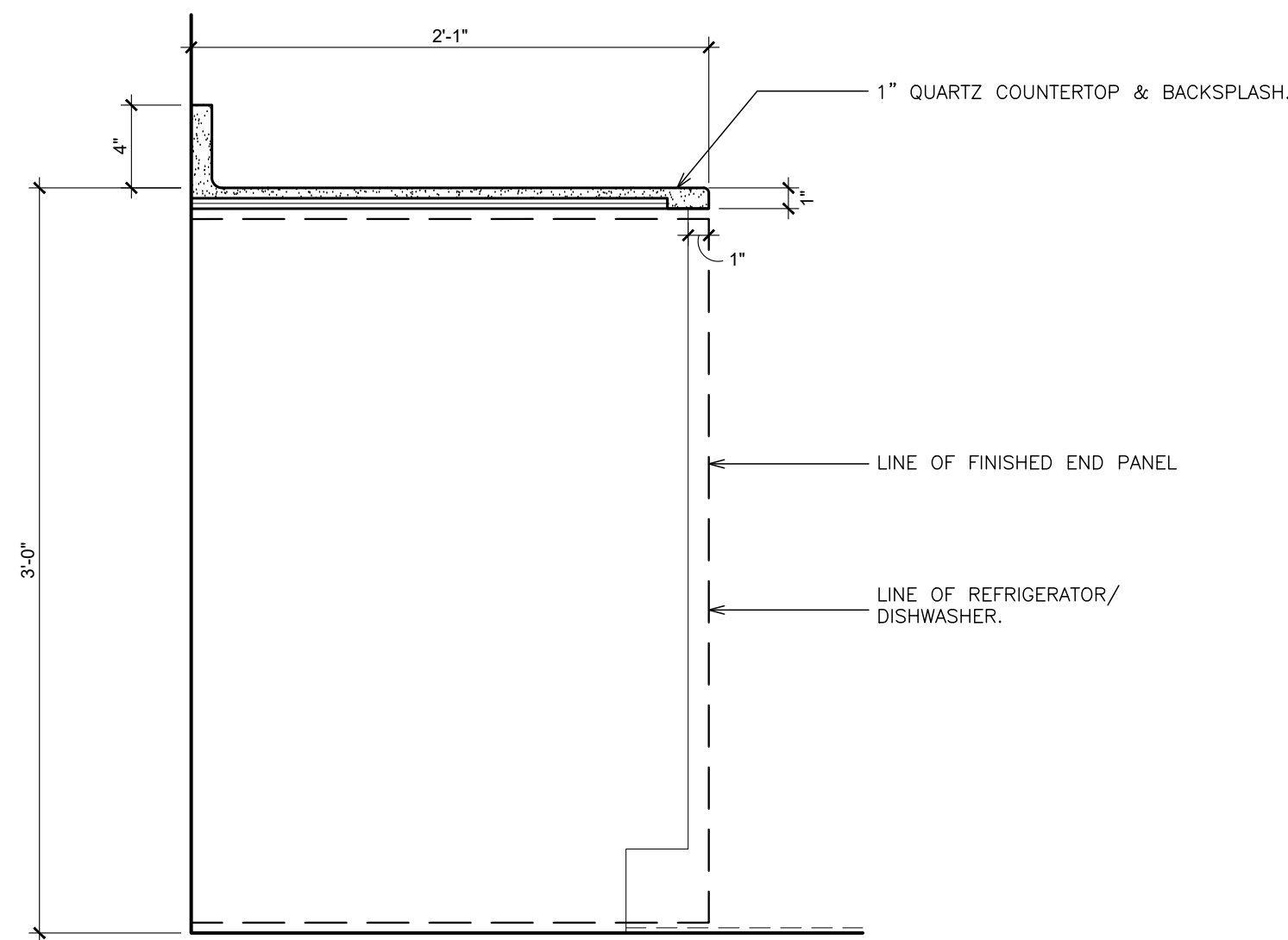
## 4 DETAIL- DRAWER CABINET

SCALE: 1 1/2" = 1'-0"



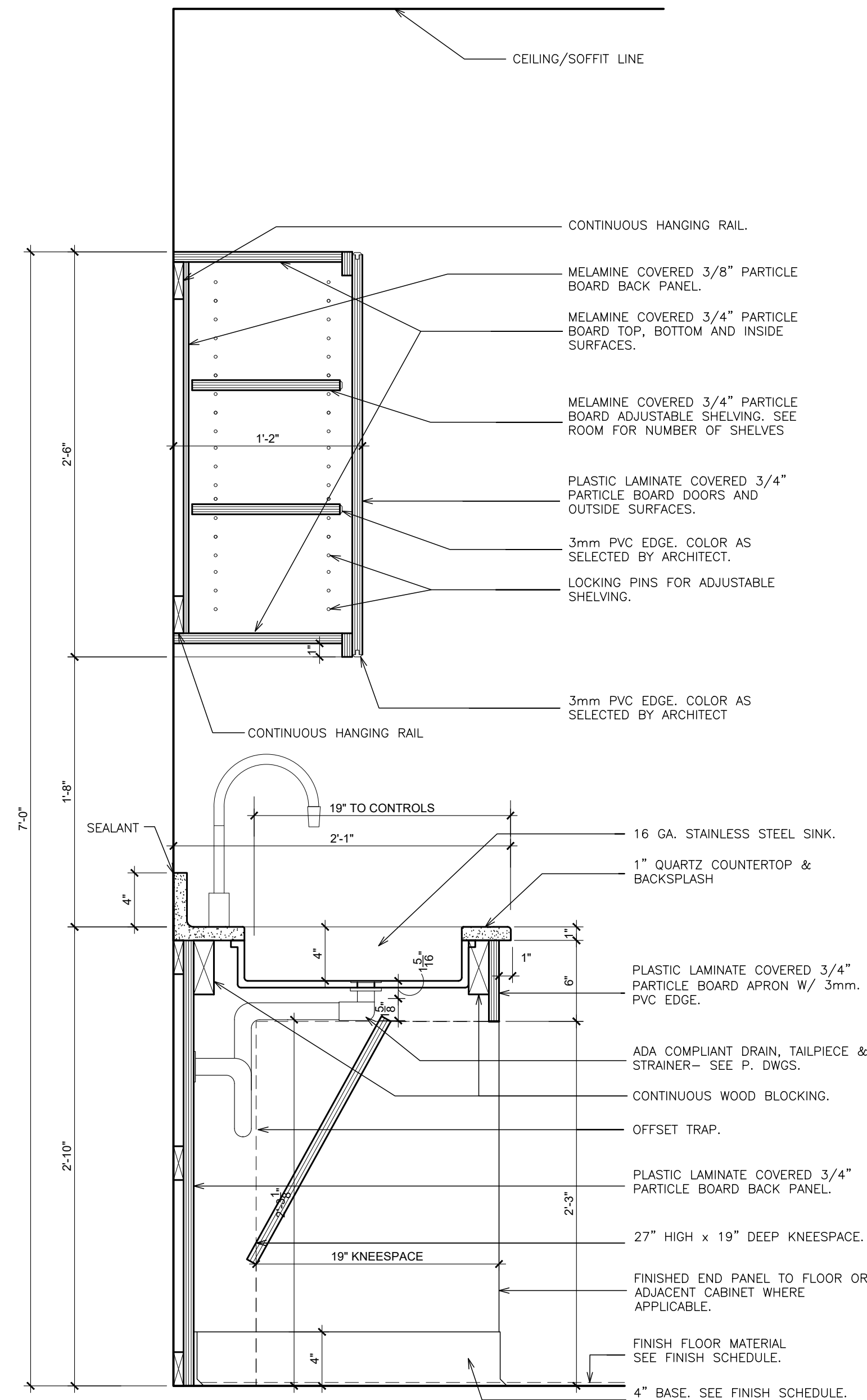
## 3 DETAIL- DISHWASHER

SCALE: 1 1/2" = 1'-0"



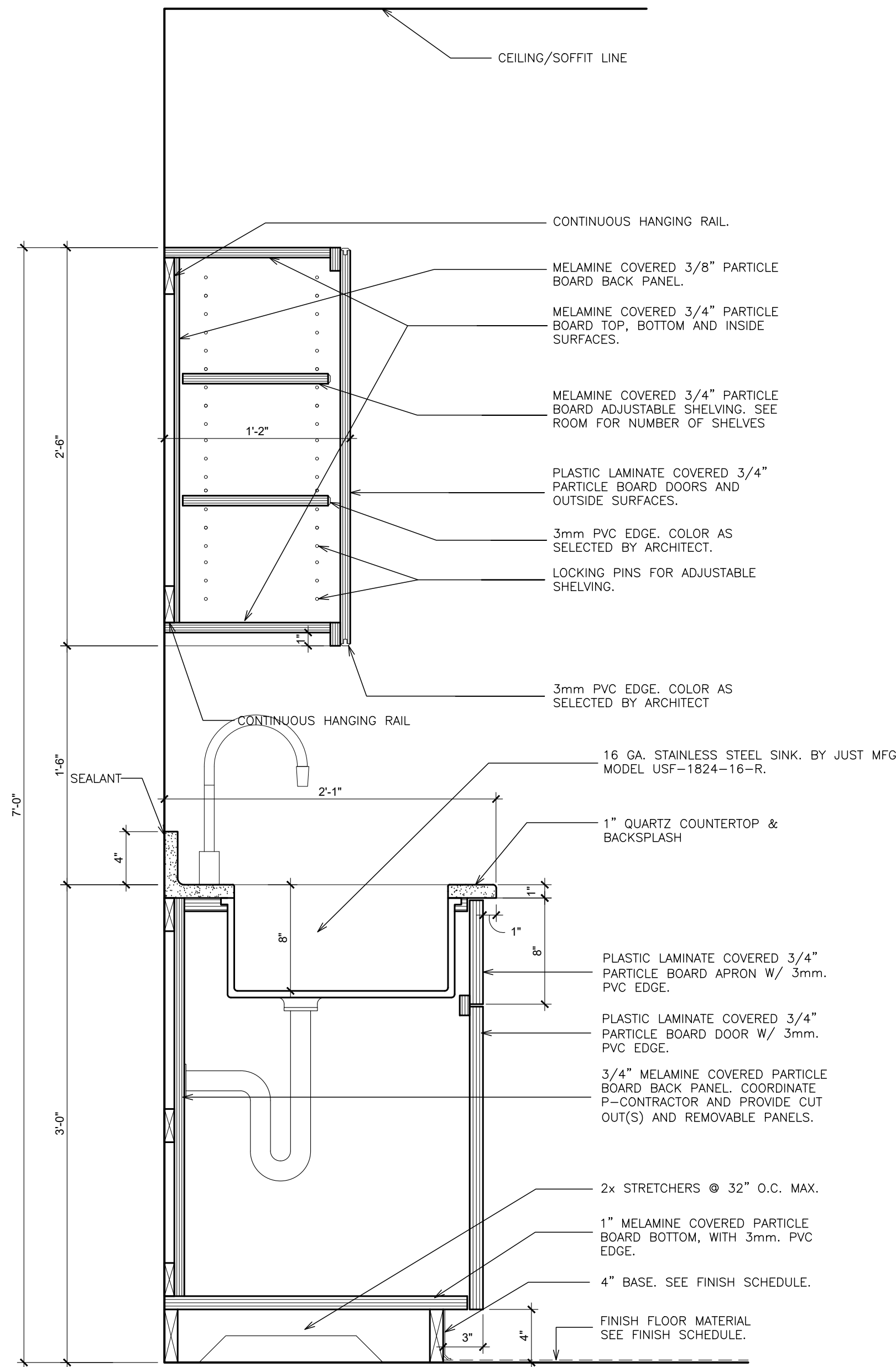
## 2 DETAIL- ADA SINK ENCLOSURE

SCALE: 1 1/2" = 1'-0"



## 1 DETAIL- SINK CABINET

SCALE: 1 1/2" = 1'-0"



PROJECT: LIFE SKILLS ROOM and RELATED WORK

MILBANK SCHOOL  
200 EAST ELM STREET, GREENWICH, CT 06830

DRAWING TITLE  
CASEWORK DETAILS

02-17-2023  
DATE

BID  
ISSUED TO

SHEET SIZE  
30"x42"

DRAWING NO.  
A525

SCALE  
AS NOTED

DRAWN BY  
F & D

FILE NO.  
22495.00

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Greenwich, Connecticut 06830-6321  
(203) 625-7400

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ELMHURST, NEW YORK 10823  
TEL 914.898.4444  
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




























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P.C.

ARCHITECTS  
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LEGEND

-  DUPLEX RECEPTACLE, TAMPER RESISTANT (MOUNT AT 18" U.N.O.)
-  DOUBLE-DUPLEX RECEPTACLE, TAMPER RESISTANT (MOUNT AT 18" U.N.O.)
-  DEDICATED SINGLE RECEPTACLE (MOUNT AT 18" U.N.O.)
-  DEDICATED RECEPTACLE WITH NEMA TYPE NOTED
-  LP/XX HOMERUN
-  JUNCTION BOX
-  TEL/CABLE RECEPTACLE (MOUNT AT 18" U.N.O.)
-  DATA RECEPTACLE (MOUNT AT 18" U.N.O.)
-  LOCKABLE DISCONNECT SWITCH WITH RATINGS
-  LOCKABLE FUSED DISCONNECT SWITCH WITH RATINGS
-  MOTOR STARTER
-  PANEL
-  RECESSED PANEL
-  LOAD CENTER
-  RECESSED LOAD CENTER
-  SWITCH
-  SWITCH, 3-WAY
-  SWITCH, MOTOR RATED
-  SWITCH, OCCUPANCY SENSOR
-  SWITCH, VACANCY SENSOR
-  SINGLE FACE EXIT SIGN, WITH DIRECTIONAL ARROWS
-  DUAL FACE EXIT SIGN, WITH DIRECTIONAL ARROWS
-  SINGLE FACE EXIT SIGN, WITH INTEGRAL EMERGENCY LIGHTS
-  SINGLE FACE CT ACCESSIBLE EXIT SIGN
-  SINGLE FACE CT ACCESSIBLE EXIT SIGN, WITH INTEGRAL EMERGENCY LIGHTS
-  WALL MOUNTED EMERGENCY LIGHTING UNIT
-  CEILING MOUNTED EMERGENCY LIGHTING UNIT
-  CONDUIT UP
-  CONDUIT DOWN
-  WIRELESS ACCESS POINT (WAP)
-  HEAT DETECTOR
-  SMOKE DETECTOR
-  CARBON MONOXIDE DETECTOR
-  HORN STROBE (MOUNT AT 80" U.N.O.)
-  STROBE (MOUNT AT 80" U.N.O.)
-  FIRE ALARM SYSTEM COMMUNICATOR
-  FIRE ALARM SYSTEM CONTROL PANEL

ABBREVIATIONS:

- RMC

GRC

RGS

IMC

EMT

PVC

FMC

LFMC

U.N.O.

TYP.

gfi

gfi

WP

UP

DN

PH

C

N

G

A

AS

AF

AT

LF

ARCH.

GC

EC

MC

PC

COORD.

SCC

MCA

FLA

RLA

LRA

MOCP

RFS

(N)

(E)

(RL)

(RP)

(R)
- RIGID METAL CONDUIT

GALVANIZED RIGID STEEL CONDUIT (NEC RMC)

SEE GRC

INTERMEDIATE METAL CONDUIT

ELECTRICAL METAL TUBING

RIGID POLYVINYL CHLORIDE CONDUIT (SCHEDULE 40 U.N.O.)

FLEXIBLE METAL CONDUIT

LIQUID TIGHT FLEXIBLE METAL CONDUIT

UNLESS NOTED OTHERWISE

TYPICAL

GROUND FAULT CIRCUIT INTERRUPTER TYPE

ARC FAULT CIRCUIT INTERRUPTER TYPE

WEATHER-PROOF WHILE IN USE TYPE

CONDUIT UP

CONDUIT DN

PHASE

CONDUIT

NEUTRAL

GROUND

AMPS (AMPERE)

AMPS SWITCHED

AMPS FUSED

AMPS TRIP

LINEAR FEET

ARCHITECT

GENERAL CONTRACTOR

ELECTRICAL CONTRACTOR

MECHANICAL CONTRACTOR

PLUMBING CONTRACTOR

COORDINATE

PROSPECTIVE SHORT CIRCUIT CURRENT

MINIMUM CIRCUIT AMPACITY

FULL LOAD AMPERES

RATED LOAD AMPERES

LOCKED ROTOR AMPERES

MAXIMUM OVER CURRENT PROTECTION

RECOMMENDED FUSE SIZE

NEW

EXISTING TO REMAIN

RELOCATE EXISTING

REPLACE EXISTING IN LOCATION

REMOVE EXISTING

ALTERNATES:

- ADD ALT E1:

ADD ALT P1:
- REPLACEMENT OF BOILER ROOM PANEL "BR" & EXTENDING AND RECONNECTING ALL CIRCUITS TO NEW PANEL. REMOVE EXISTING BOILER ROOM PANEL "BR".

FURNISH & INSTALL NEW INSTANTANEOUS DOMESTIC HOT WATER HEATER AND ASSOCIATED POWER AND VENT PIPING.
- CONTRACTOR SHALL PERFORM ALL WORK IN STRICT COMPLIANCE TO ALL APPLICABLE CODES AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION. INCLUDING BUT NOT LIMITED TO:

2022 CONNECTICUT STATE BUILDING CODE

2021 INTERNATIONAL BUILDING CODE

2021 INTERNATIONAL EXISTING BUILDING CODE

2021 INTERNATIONAL PLUMBING CODE

2021 INTERNATIONAL MECHANICAL CODE

2021 INTERNATIONAL RESIDENTIAL CODE

2021 INTERNATIONAL ENERGY CONSERVATION CODE

2021 INTERNATIONAL SWIMMING POOL AND SPA CODE

2020 NATIONAL ELECTRIC CODE (NFPA 70)

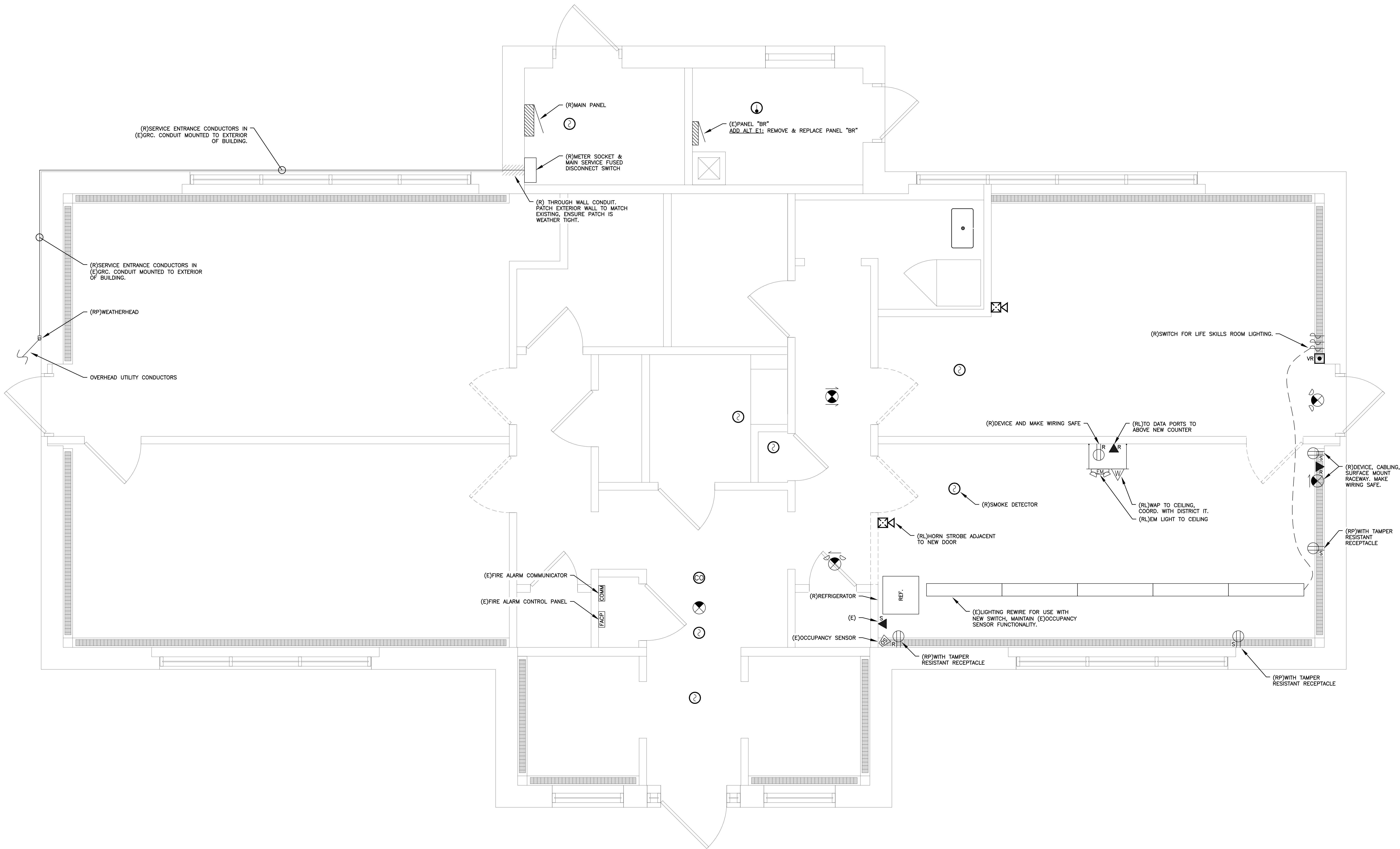
2017 ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES
- CODE NOTES:
1.

CONTRACTOR SHALL COORDINATE WITH OWNER'S IT DEPARTMENT FOR ANY RELOCATION OF TEL/DATA/IT DEVICES OR EQUIPMENT.
- IT NOTES:
1.

CONTRACTOR SHALL COORDINATE WITH OWNER'S IT DEPARTMENT FOR ANY RELOCATION OF TEL/DATA/IT DEVICES OR EQUIPMENT.
- DRAWING SCHEDULE
- | SCOPE OF WORK | DRAWING NUMBER | DRAWING DESCRIPTION   |
|---------------|----------------|---|
| GENERAL       | E001           | ELECTRICAL LEGEND, NOTES, ABBREVIATIONS, KEY PLAN, & DRAWING SCHEDULE |
| ELECTRICAL    | ER100          | FIRST FLOOR ELECTRICAL REMOVALS PLAN                                  |
|               | E100           | FIRST FLOOR ELECTRICAL PLAN   |
|               | ES100          | SITE ELECTRICAL PLAN  |
|               | E200           | ELECTRICAL DIAGRAMS, DETAILS, & SCHEDULES                             |
| MECHANICAL    | M100           | FIRST FLOOR MECHANICAL PLAN   |
| PLUMBING      | P001           | PLUMBING SCHEDULE, NOTES, LEGEND & DETAILS                            |
|               | P100           | FIRST FLOOR PLUMBING PLAN   |
- AREA OF WORK
- AREA OF WORK
- KEY PLAN  
N.T.S.
- 
- PLOT DATE: February 16, 2023 -- 11:27am
- FILE: N:\Greenwich Public Schools\Milbank School\2023 Life Skills\ACAD\Electrical\MILBANK LIFE\_SK\_ELEC.dwg
- AS PER USA CONGRESS ARCHITECTURAL WORKS COPYRIGHT PROTECTION ACT OF 1990 ALL IDEAS AND DESIGNS INCLUDING DERIVATIVES THEREOF, ALL DRAWINGS AND SPECIFICATIONS CONSTITUTE THE ORIGINAL COPYRIGHT WORK BY FULLER AND DANKELO, P.C. (F&D). THE DRAWINGS AND SPECIFICATIONS AS INSTRUMENTS OF SERVICE BY F&D ARE CREATED BY F&D FOR THIS PROJECT ONLY AND REMAIN THE PROPERTY OF F&D. ANY REPRODUCTION WITHOUT THE PRIOR CONSENT OF F&D IS PROHIBITED.
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Haveneyer Building  
250 Greenwich Avenue  
Greenwich, Connecticut 06830-6521  
(203) 625-7400
- 408 SHELLWOOD ROAD ELIMFIELD NEW YORK 10828  
TEL: 914-898-4444 FAX: 914-898-1919  
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- FULLER  
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P.C.**  
**ARCHITECTS  
PLANNERS**
- LFG**  
252 East Avenue  
Norwalk, CT 06855  
(203) 866-8028 FAX: (203) 866-8019  
LANDMARK FACILITIES GROUP, INC.
- PROJECT TITLE  
LIFE SKILLS ROOM AND RELATED WORK  
MILBANK SCHOOL  
200 EAST ELM STREET GREENWICH, CT 06830  
DRAWING TITLE  
ELECTRICAL LEGEND, NOTES, ABBREVIATIONS, KEY PLAN, & DRAWING SCHEDULE
- |                       |                            |
|-----------------------|----------------------------|
| 02-17-2023            | BID                        |
| DATE                  | ISSUED TO                  |
| SHEET SIZE<br>30"x42" | DRAWING NO.<br><b>E001</b> |
| SCALE<br>AS NOTED     | FILE NO.<br>22495.00       |
| DRAWN BY<br>LFG       |                            |

NOTES:

1. ANY DEVICES, EQUIPMENT, WIRING, RACEWAYS, ETC. SHOWN ON THIS PLAN IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.



1 FIRST FLOOR ELECTRICAL REMOVALS PLAN  
SCALE: 1/2" = 1'-0"

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GREENWICH PUBLIC SCHOOLS  
Havenhey Building  
250 Greenwich Avenue  
Greenwich, Connecticut 06830-6521  
(203) 625-7400

48 SHELLWOOD ROAD ELLENFIELD NEW YORK 10888  
TEL: 914.898.4444 FAX: 914.898.1919  
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LFG  
252 East Avenue  
Norwalk, CT 06855  
(203) 866-8026 FAX  
(203) 866-8019 FAX  
LANDMARK  
FACILITIES  
GROUP, INC.

PROJECT TITLE  
LIFE SKILLS ROOM AND RELATED WORK  
MILBANK SCHOOL  
200 EAST ELM STREET GREENWICH CT 06830  
DRAWING TITLE  
FIRST FLOOR  
ELECTRICAL REMOVALS PLAN

DATE	02-17-2023	ISSUED TO	BID
SHEET SIZE	30"x42"	DRAWING NO.	ER100
SCALE	AS NOTED	FILE NO.	22495.00
DRAWN BY	LFG		

1. EC SHALL PROVIDE ALL NECESSARY PLANKING FOR ATTIC WORK



SCALE: 1/2" = 1'-0"

FILE: N:\Greenwich Public Schools\Milbank School\2023 Life Skills\ACAD\Electrical\MILBANK LIFE SK\_ELEC.dwg

CH PUBLIC

Havemeyer Building  
90 Greenwich Avenue  
New Rochelle, Connecticut 06830-6521  
(203) 625-7400

FULLER  
D'ANGELO  
P.C.



252 East Avenue  
Norwalk, CT 06855  
(203) 866-4626 Fax  
(203) 866-8019 Fax

**LANDMARK  
FACILITIES  
GROUP, INC.**

DRAWING TITLE

FIRST FLOOR

ELECTRICAL PLAN

BID
ISSUED

DRAWING NO.

E10

FILE NO.  
2249

E100


FILE NO.  
22495 0



NOTES:

1. SITE BACKGROUND GENERATED FROM GOOGLE MAPS. DRAWING IS DIAGRAMMATIC, DO NOT SCALE. FIELD MEASURE ALL DIMENSIONS, UNLESS SPECIFIED.

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**GREENWICH PUBLIC SCHOOLS**

Havenkwy Building  
290 Greenwich Avenue  
Greenwich, Connecticut 06830-6221  
(203) 625-7400

**FULLER  
D'ANGELO  
P.C.**

ARCHITECTS  
PLANNERS

408 KILLDEWEE ROAD ELLENFIELD NEW YORK 10889 FAX: 914.899.1179  
TEL: 914.899.4444  
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**LFG**

252 East Avenue  
Norwalk, CT 06855  
(203) 866-8026 Fax  
(203) 866-8019 Fax

LANDMARK  
FACILITIES  
GROUP, INC.

PROJECT  
LIFE SKILLS ROOM AND RELATED WORK

MILBANK SCHOOL  
209 EAST ELM STREET, GREENWICH, CT 06830

DRAWING TITLE

**SITE ELECTRICAL PLAN**

DATE

02-17-2023

ISSUED TO

BID

SHEET SIZE

30"x42"

DRAWING NO.

ES100

SCALE


AS NOTED

DRAWN BY

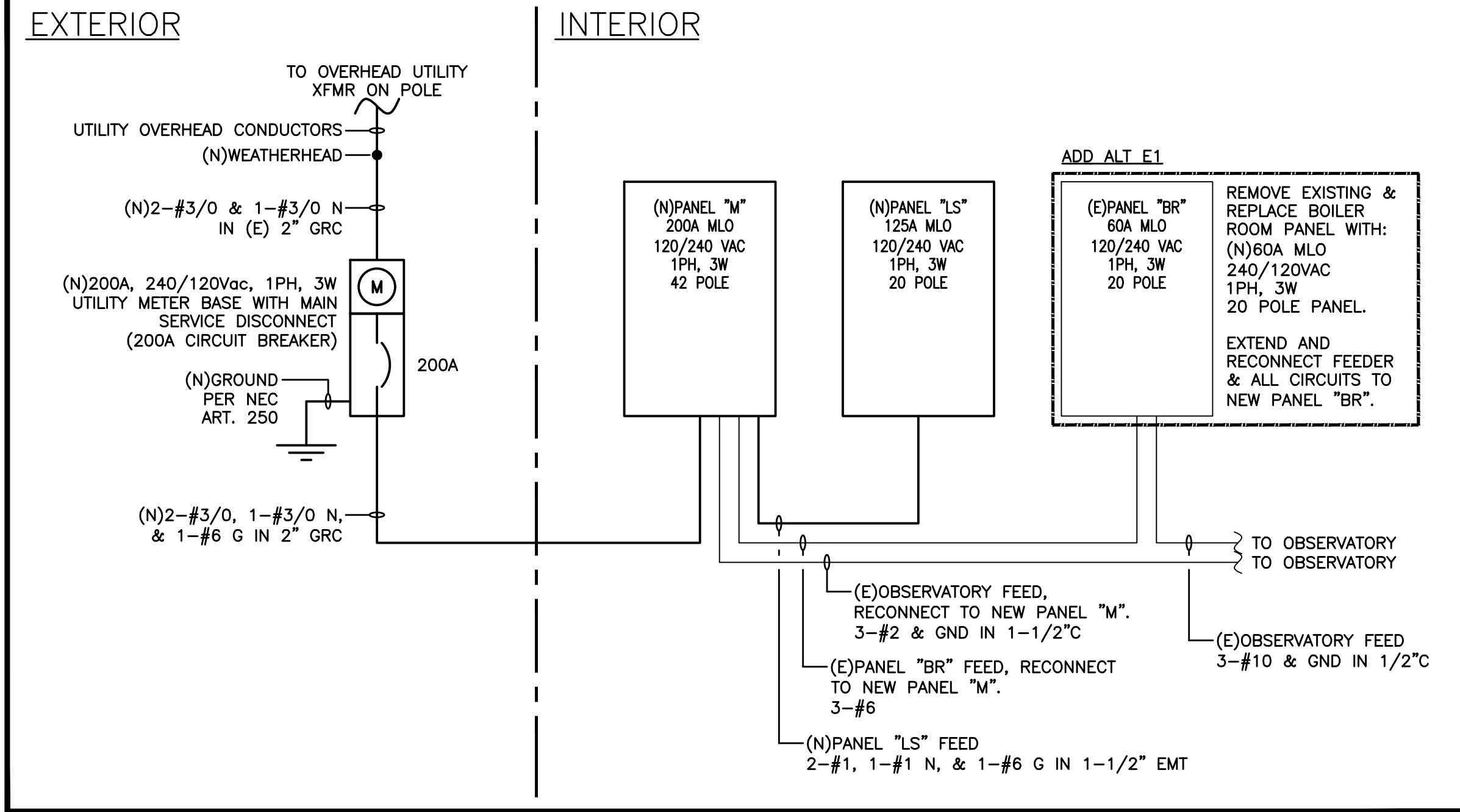
LFG

FILE NO.

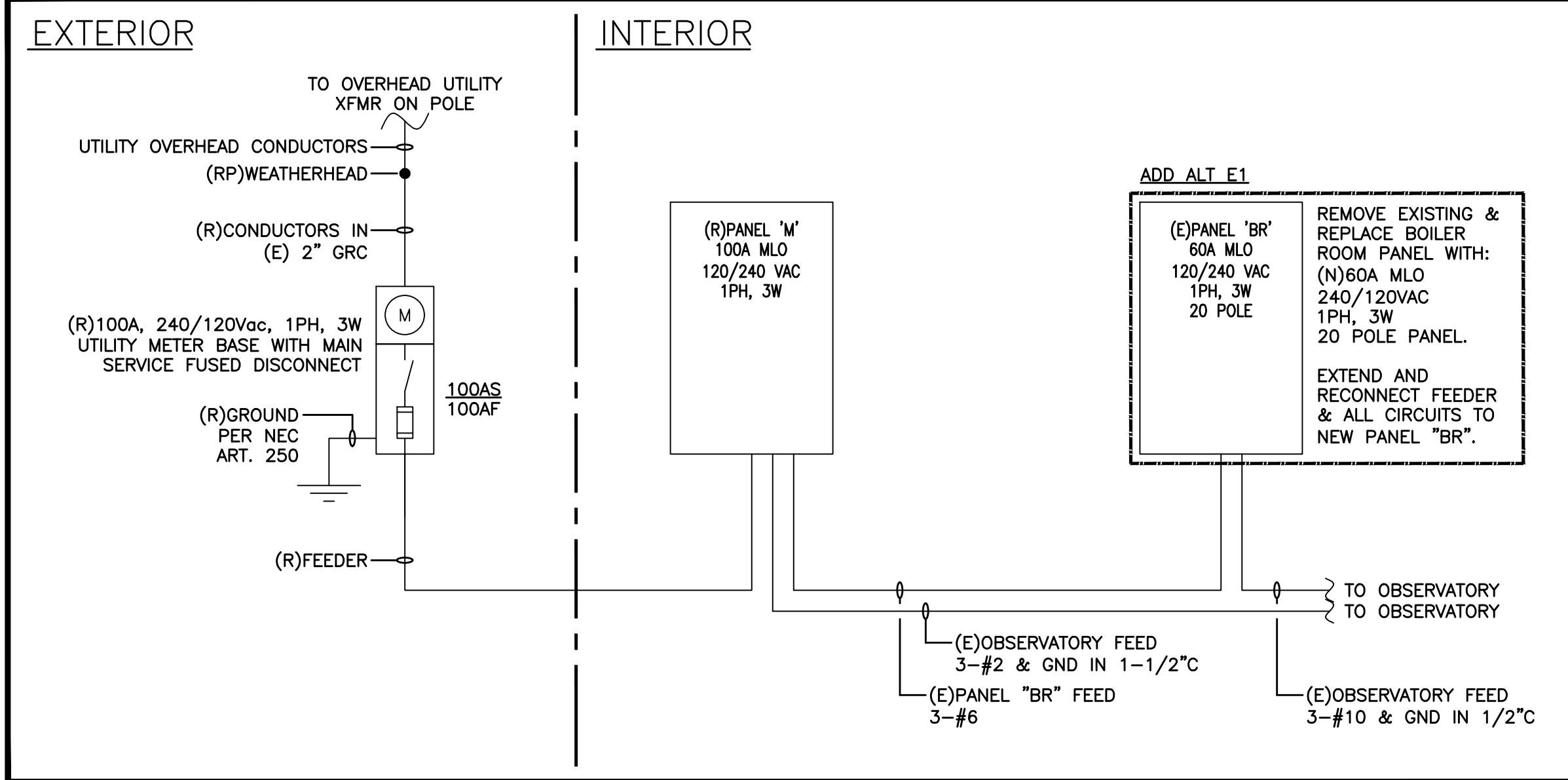
22495.00



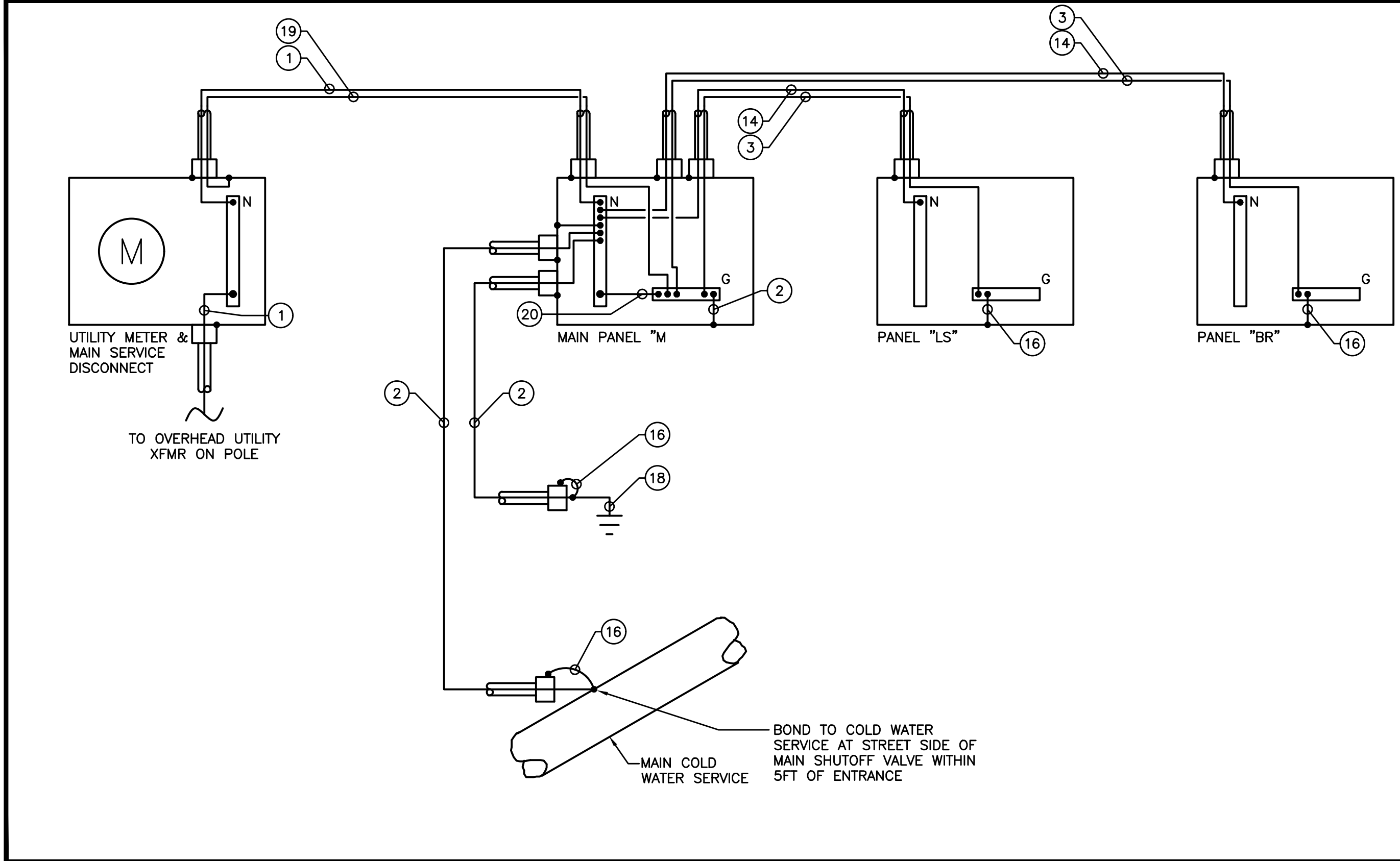
## NEW ONE LINE DIAGRAM



## EXISTING ONE LINE DIAGRAM



## GROUNDING SYSTEM DIGRAM

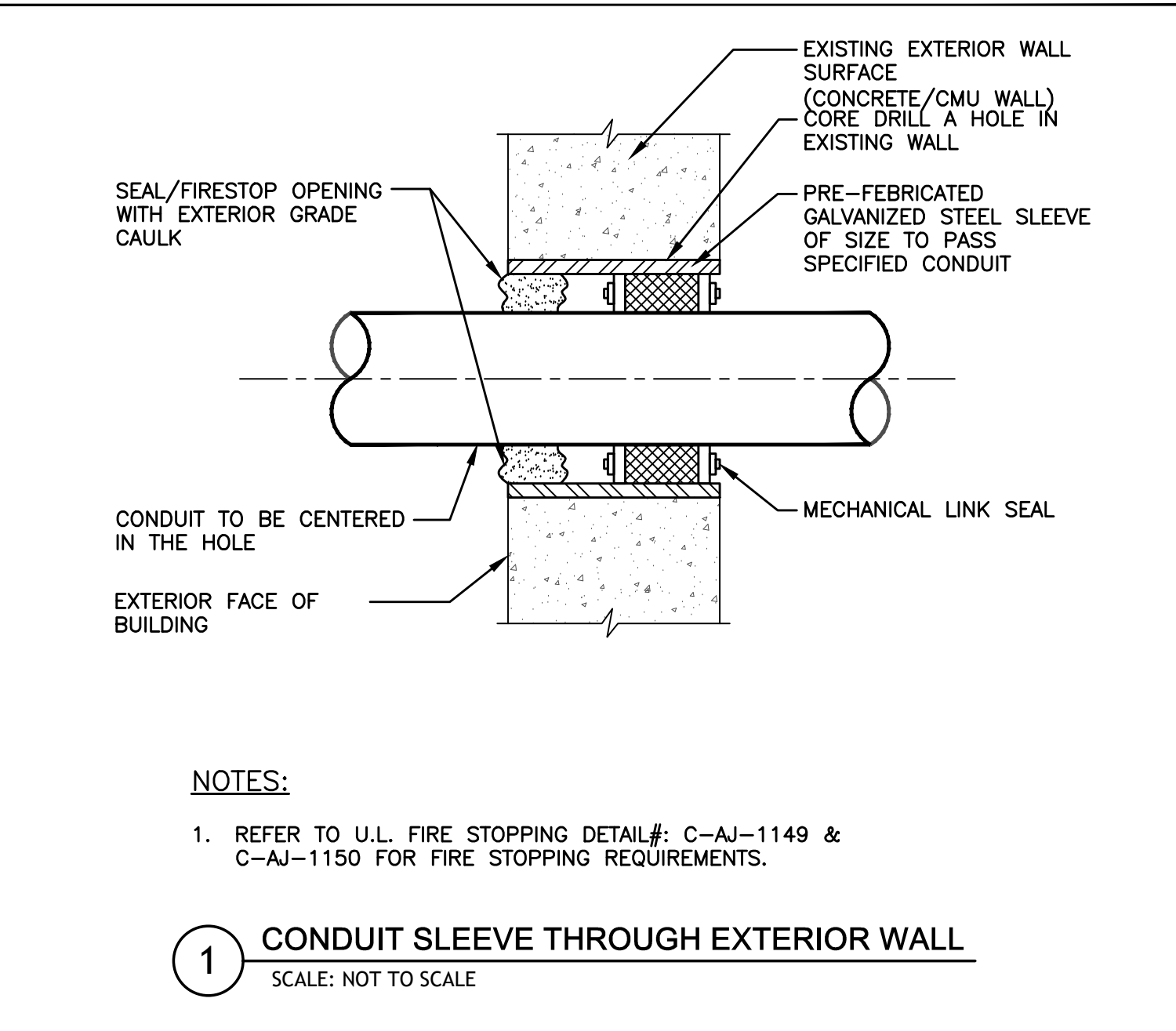


## NOTES:

- REFER TO U.L. FIRE STOPPING DETAIL# C-AJ-1149 & C-AJ-1150 FOR FIRE STOPPING REQUIREMENTS.

## 1 CONDUIT SLEEVE THROUGH EXTERIOR WALL

SCALE: NOT TO SCALE



## LOAD SUMMARY:

DESCRIPTION	POWER	NOTES
EXISTING BUILDING	+6.500kW	11/2021-11/2022 UTILITY BILL PEAK DEMAND (5.2kW * 1.25 = 6.5kW)
RANGE	+8.400kW	12.5kW CONNECTED (8kW * 1.05 = 8.4kW) PER 220.55
DRYER	+5.600kW	
MICROWAVE	+1.580kW	
REFRIGERATOR	+1.000kW	
LAUNDRY	+1.500kW	
RANGE HOOD	+0.120kW	
DISHWASHER	+0.800kW	
RECEPTACLE	+4.500kW	
GAS WATER HEATER	+0.200kW	
TOTAL DESIGN LOAD:	0.30.200kW	
TOTAL CURRENT: 126A LOAD = 200A SERVICE SIZE		(CALCULATED AT 240/120VAC, 1PH, 3W)

## NEW PANEL SCHEDULE (SHOWN AS PANEL M)

120/240V, 1 PHASE, 3 WIRE PANELBOARD														LINE BUS: 200A NEUTRAL BUS: 200A MAIN LUGS: 200A SCCR: 22KA			
BRANCH POLES: 40 POLE MOUNTING: SURFACE (HINGED) (PROVIDE LOCKING COVER) SIEMENS PN404L1200SGC DIMENSIONS: 36"X 14-1/4"W X 3-7/8"D																	
Description	Notes	Wire	Ground	Conduit	BRKR	Pole	PH-A	PH-B	Pole	BRKR	Conduit	Ground	Wire	Notes	Description		
Life Skills Room Panel "LS"		1	6	1-1/2"	125A	1	11800		2	100A	1-1/2"		2		Observatory Feed		
Boiler Room Panel "BR"		6			50A	5	0		6	15A			8		Existing Branch Circuit		
Existing Branch Circuit					15A	9			8	15A			10		Existing Branch Circuit		
Existing Branch Circuit					15A	11			12	20A			12		Existing Branch Circuit		
Existing Branch Circuit					20A	13			14	20A			16		Existing Branch Circuit		
Existing Branch Circuit					15A	15			16	15A			18		Existing Branch Circuit		
Existing Branch Circuit					20A	17			18	15A			22		Existing Branch Circuit		
Existing Branch Circuit					20A	19			20	15A			26		Existing Branch Circuit		
Existing Branch Circuit					15A	21			22	15A			30		Existing Branch Circuit		
Existing Branch Circuit					20A	23			24	15A			34		Existing Branch Circuit		
Fire Alarm Circuit					15A	25			26	15A			36		Existing Branch Circuit		
Existing Branch Circuit					15A	27			28	20A			38		Existing Branch Circuit		
Existing Branch Circuit					20A	29			30								
Existing Branch Circuit					20A	31			32								
Existing Branch Circuit					20A	33			34								
Gas Water Heater		12	12	1/2"	15A	35		200	36								
						37			38								
						39			40								
						total-A				total-B							
						14400				14500							
TOTAL CONNECTED LOAD:						28900		VA		=		120		AMPS			
TOTAL DESIGN LOAD:						28900		VA		=		120		AMPS			
25% CONTINUOUS LOAD:						1300		VA		=		5		AMPS			
TOTAL:						30.2		KVA		=		126		AMPS			

NOTE: Existing building 5kW peak demand load is included in this panel's load calculations.

## NEW LIFE SKILLS PANEL SCHEDULE (SHOWN AS PANEL LS)

120/240V, 1 PHASE, 3 WIRE PANELBOARD														LINE BUS: 125A			
BRANCH POLES: 20 POLE														NEUTRAL BUS: 125A			
MOUNTING: FLUSH (HINGED) (PROVIDE LOCKING COVER)														MAIN LUGS: 125A			
SIEMENS PN2020L1125FGC														SCCR: 10KA			
DIMENSIONS: 21"H x 14-1/4"W x 3-7/8"D																	
Description	Notes	Wire	Ground	Conduit	BRKR	Pole	PH-A		PH-B	Pole	BRKR	Conduit	Ground	Wire	Notes	Description	
Range		8	10	3/4"	40A	1	4200	2800		2	30A	1/2"	10	10		Dryer	
Dishwasher		5	12	12	1/2"	15A	5	800	1500	6	20A	1/2"	12	12		Rcpt-Life Skills Rm Counter	
Microwave		5	12	12	1/2"	20A	7		1680	1500	8	20A	1/2"	12	12	Rcpt-Life Skills Rm Counter	
Refrigerator		5	12	12	1/2"	15A	9	1000	1500	10	20A	1/2"	12	12		Rcpt-Life Skills Rm Counter	
Laundry		5	12	12	1/2"	15A	11		1500	120	12	15A	1/2"	12	5	Range Hood	
Spare					20A	13				14	20A					Spare	
Spare					20A	15				16	20A					Spare	
Spare					20A	17				18	20A					Spare	
Spare					20A	19				20	20A					Spare	
							total-A		total-B								
							11800		11700								
TOTAL CONNECTED LOAD:							23500		VA	=	98	AMPS					
TOTAL DESIGN LOAD:							23500		VA	=	98	AMPS					
25% CONTINUOUS LOAD:							0		VA	=	0	AMPS					
TOTAL:							23.5		KVA	=	98	AMPS					

## NOTES:

- PROVIDE HACR TYPE CIRCUIT BREAKER
- PROVIDE LOCKING CLIPS
- PROVIDE MEANS OF LOCKING CIRCUIT BREAKER IN OFF POSITION
- VERIFY POWER REQUIREMENTS FOR ACTUAL EQUIPMENT BEFORE INSTALLATION
- PROVIDE GFCI CIRCUIT BREAKER
- PROVIDE AFCI CIRCUIT BREAKER
- PROVIDE DUAL FUNCTION CIRCUIT BREAKER
- CIRCUIT CONTROLLED VIA TIMECLOCK

## [ADD ALT E1] BOILER ROOM PANEL "BR" SCHEDULE (SHOWN AS PANEL BR)

120/240V, 1 PHASE, 3 WIRE PANELBOARD														LINE BUS: 60A NEUTRAL BUS: 60A MAIN LUGS: 60A SCCR: 22KA			
BRANCH POLES: 20 POLE MOUNTING: SURFACE (HINGED)																	
Description	Notes	Wire	Ground	Conduit	BRKR	Pole	PH-A	PH-B	Pole	BRKR	Conduit	Ground	Wire	Notes	Description		
Data Closet		12	12	1/2"	20A	1			2	30A	1/2"	10	10		Observatory Feed		
Data Closet		12	12	1/2"	20A	3			4	30A	1/2"	10	10		Existing Branch Circuit		
Gas Heater (Boiler)		12	12	1/2"	15A	5			6	15A	1/2"	12	12		Boiler Room Outlets		
Spare					15A	7			8	15A	1/2"	12	12		Spare		
Spare					15A	9			10	15A					Spare		
Spare					15A	11			12	15A					Spare		
Spare					15A	13			14	15A					Spare		
Spare					15A	15			16	15A					Spare		
Spare					15A	17			18	15A					Spare		
Spare					15A	19			20	15A					Spare		
total-A							total-B										
0							0										
TOTAL CONNECTED LOAD:							VA =							0 AMPS			
TOTAL DESIGN LOAD:							VA =							0 AMPS			
25% CONTINUOUS LOAD:							VA =							0 AMPS			
TOTAL:							KVA =							0 AMPS			

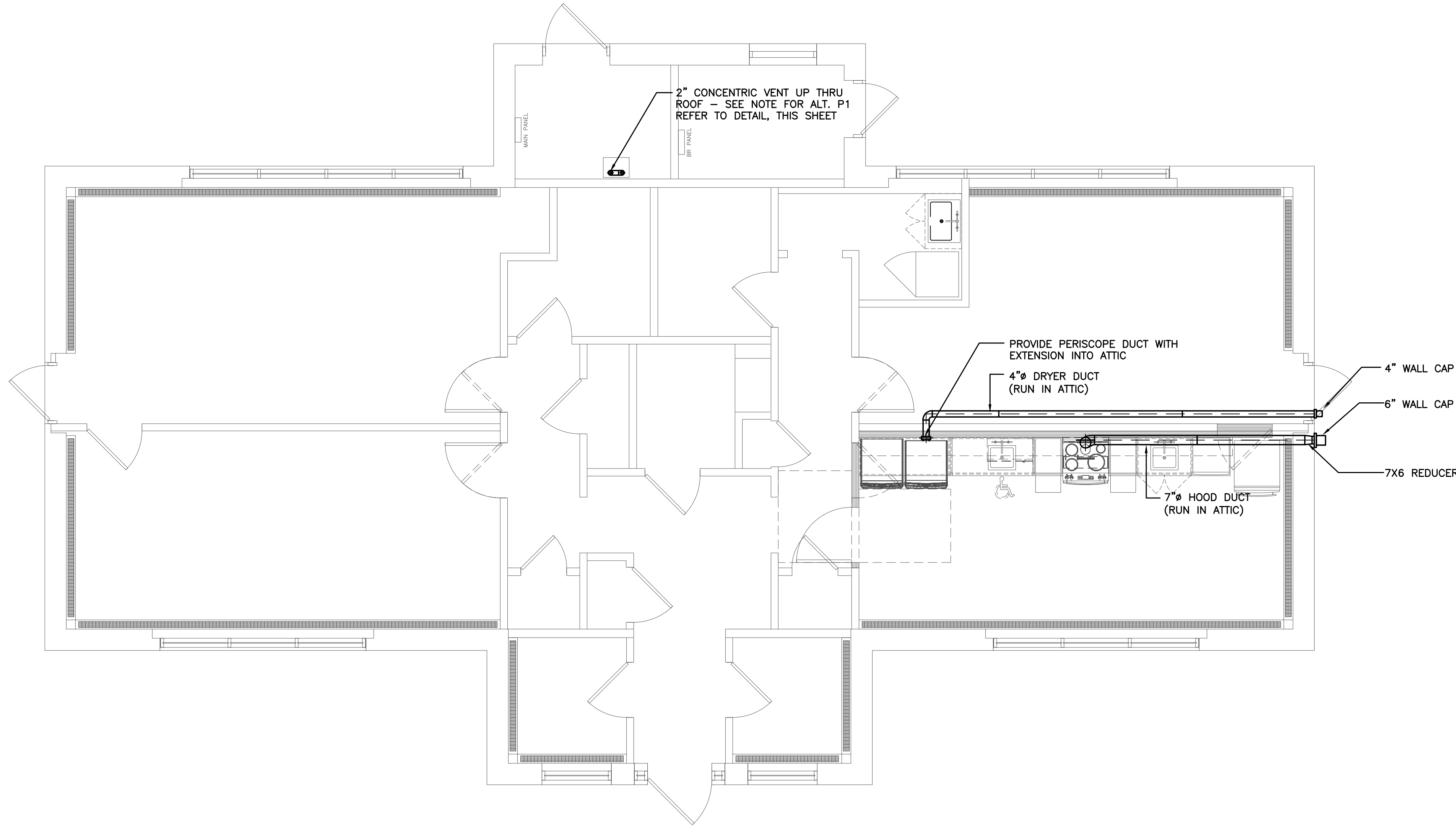
## NOTES:

- PHASE CONDUCTORS OMITTED FOR CLARITY.
- ALL GROUNDED (NEUTRAL) AND EQUIPMENT GROUNDING CONDUCTOR SIZES ARE SHOWN ON ONE LINE DIAGRAM.
- THIS DIAGRAM INDICATED GENERAL ARRANGEMENT OF GROUNDING REQUIREMENTS ONLY. FOR COMPLETE DISTRIBUTION REFER TO POWER ONE LINE DIAGRAM.
- INSTALL GROUNDING CONNECTIONS TO BUILDING STRUCTURE AND WATER PIPES AT LOCATIONS THAT ARE VISIBLE AND ACCESSIBLE FOR INSPECTION, MAINTENANCE, AND TESTING.

## KEYED NOTES:

- NEUTRAL (GROUNDED CONDUCTOR)
- GROUNDING ELECTRODE CONDUCTOR, SIZED BASED ON NEC TABLE 250.66 USING THE SERVICE PHASE CONDUCTOR SIZE. BUILDING GROUNDING ELECTRODE SYSTEM SHALL INCLUDE ALL AVAILABLE POINTS:
  - UNDERGROUND METAL WATER PIPE (WITHIN 5' OF ENTRANCE & PRIOR TO ANY VALVE)
  - BUILDING STEEL
  - OTHER METAL PIPING
  - MADE ELECTRODEGROUNDING ELECTRODE CONDUCTOR INSTALLED WITHOUT CONDUIT (USE CONDUIT FOR PHYSICAL PROTECTION WHEN APPROPRIATE) NEC 250.92.
- INSTALL EQUIPMENT GROUNDING CONDUCTOR SIZED BASED ON NEC TABLE 250.122 USING THE FEEDER OVERCURRENT DEVICE SIZE.
- EQUIPMENT GROUNDING CONDUCTOR THAT IS SIZED BASED ON NEC TABLE 250.122 USING THE SEPARATELY DERIVED SYSTEM OVERCURRENT DEVICE SIZE.
- INSTALL BONDING JUMPER WIRE THAT IS SIZED BASED ON NEC TABLE 250.102(C)(1) PER NEC SECTION 250.30(A)(1) USING THE SEPARATELY-DERIVED SYSTEM PHASE CONDUCTOR SIZE.
- INSTALL A BUILDING GROUND LOOP AROUND THE PERIMETER OF THE BUILDING.
- BOND FOUNDATION REBAR TO THE BUILDING GROUND LOOP. USE COMPRESSION CONNECTORS THAT MEET IEEE 837 REQUIREMENTS OR USE EXOTHERMIC WELDS.
- "MAIN GROUND ELECTRODE GROUND BAR" FOR SINGLE POINT GROUNDING. LOCATE IN MAIN ELECTRIC ROOM. MAKE CONNECTIONS TO THE GROUND ELECTRODE CONDUCTOR USING IRREVERSIBLE CONNECTORS OR EXOTHERMIC WELDS. MAKE OTHER CONNECTIONS TO THE GROUND BAR USING TWO-HOLE COMPRESSION SPADE LUGS THAT MEET IEEE 837 REQUIREMENTS. LABEL EACH CONNECTION TO THE GROUND BAR.
- LIGHTNING PROTECTION GROUND ROD. REFER TO LIGHTNING PROTECTION SUPPLIER FOR QUANTITY.

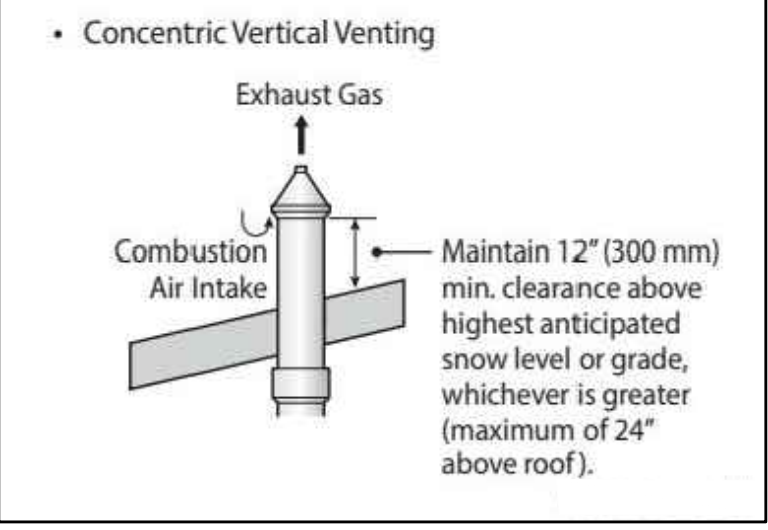
- BOND THE LIGHTNING PROTECTION SYSTEM GROUNDING COUNTERPOISE TO THE MAIN GROUND ELECTRODE GROUND BAR. USE #4/0 AWG COPPER CABLE WITH 600 VOLT INSULATION. AT THE UNDERGROUND CONNECTION USE A COMPRESSION CONNECTOR THAT MEETS IEEE 837 REQUIREMENTS OR USE AN EXOTHERMIC WELD.
- GROUNDING ELECTRODE CONDUCTOR SHALL BE ROUTED TO THE CLOSEST AVAILABLE ELECTRODE. (IN ORDER OF PREFERENCE)
  - SUPPLEMENTAL GROUND BUS
  - BUILDING STEEL
  - WATER PIPE
  - MADE ELECTRODE BONDED AT SERVICEWHEN CONDUIT IS USED IT SHALL BE BONDED AT BOTH ENDS. RUN GROUNDING ELECTRODE PER NEC ARTICLE 250.30.
- INSTALL IRREVERSIBLE COMPRESSION CONNECTOR WITH TAMPER-PROOF HARDWARE OR INSTALL EXOTHERMIC WELD.
- INSTALL A COPPER GROUNDING BAR IN EACH TELECOMMUNICATIONS ROOM. CONNECT TO THE "MAIN GROUNDING ELECTRODE GROUND BAR" USING 600V INSULATED #4/0 COPPER CABLE AND COMPRESSION SPADE LUGS.
- NEUTRAL CONDUCTOR THAT IS NOT LESS THAN THE PHASE CONDUCTOR AMPACITY.
- ISOLATED GROUND CONDUCTOR, COPPER 600V INSULATED CABLE SAME SIZE AS EQUIPMENT GROUND CONDUCTOR.
- INSTALL BONDING JUMPER FROM GROUND BUSHING TO GROUND BUS SIZED PER NEC SECTION 250.102(D) (NEC TABLE 250.122)
- OVERSIZED NEUTRAL CONDUCTOR.
- GROUND ROD. 3/4"x10' LONG COPPER CLAD.
- BONDING CONDUCTOR, SIZED BASED ON NEC TABLE 250.102(C)(



1 FIRST FLOOR MECHANICAL PLAN  
SCALE: 1/4" = 1'-0"

NOTES:

- REFER TO WRITTEN (BOOK) SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  - DRYER DUCT JOINTS SHALL BE MADE WITH CLAMPS; SHEET METAL SCREWS ARE NOT PERMITTED. DUCTWORK SHALL BE SMOOTH GALVANIZED SHEET METAL; FLEXIBLE DRYER DUCTWORK IS NOT PERMITTED.
  - WALL CAPS SHALL BE GREENHECK MODEL "WC". PROVIDE INSECT SCREEN FOR WC-6 SERVING RANGE HOOD.
- ALTERNATE #P1:  
PROVIDE SEPARATE LINE ITEM PRICE IN BASE BID TO FURNISH AND INSTALL VENT & COMBUSTION AIR PIPING AND TERMINATION THRU ROOF. VENT APPLIANCE USING MANUFACTURER'S CONCENTRIC VENT KIT, IPEX MODEL NO. 397105.



2 WATER HEATER VENT DETAIL  
NOT TO SCALE

LEGEND	
[M], MD	MOTORIZED DAMPER
ARCH	ARCHITECT
UP	DUCT UP
DN	DUCT DOWN
FCU	FAN COIL UNIT
LD	LINEAR DIFFUSER
CFM	CUBIC FEET PER MINUTE, AIR
R/A	RETURN AIR
S/A	SUPPLY AIR
OA	OUTSIDE AIR
EXH	EXHAUST
EG	EXHAUST GRILLE
(E)	EXISTING
(N)	NEW
(CD)	CEILING DIFFUSER
TYP.	TYPICAL
WMS	WIRE MESH SCREEN
ZS	ZONE SENSOR
RTU	ROOF-TOP UNIT
ERV	ENERGY RECOVERY VENTILATOR
HWC	HOT WATER COIL
MANU.	MANUFACTURER
TEMP	TEMPERATURE
MCA	MINIMUM CIRCUIT AMPACITY
RFS	RECOMMENDED FUSE SIZE
FLA	FULL LOAD AMPERES
MOCP	MAXIMUM OVERCURRENT PROTECTION
QTY	QUANTITY
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
EAT	ENTERING AIR TEMPERATURE
LAT	LEAVING AIR TEMPERATURE
[Hatched Box]	DEMOLISH HIGHLIGHTED DUCTWORK AND EQUIPMENT
FD	FIRE DAMPER
HP	HEAT PUMP
Ⓢ	THERMOSTAT
[SD]	DUCT SMOKE DETECTOR
[CD]	CARBON DIOXIDE SENSOR
#X#	DUCT DIMENSIONS (CLEAN INSIDE DIM.)
RAG	RETURN AIR GRILLE
—	NEW CONDENSATE PIPING
—	NEW REFRIGERANT PIPING
[T-Junction]	VOLUME DAMPER ACROSS DUCTWORK
CWH	CABINET WALL HEATER
CCH	CEILING CABINET HEATER
FCP	FACTORY CONTROL PANEL
GV	NAT. GAS VALVE
C/S	COMPRESSOR STATUS
FA	FILTER ALARM
DPS	DIFF. PRESSURE SWITCH
[C/C]	COOLING COIL
[H/C]	HEATING COIL
[Section Line]	SECTION LINE
[Circle with Arrow]	POINT OF CONNECTION, NEW WORK TO EXISTING

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Haveney Building  
290 Greenwich Avenue  
Greenwich, Connecticut 06830-6521  
(203) 625-7400

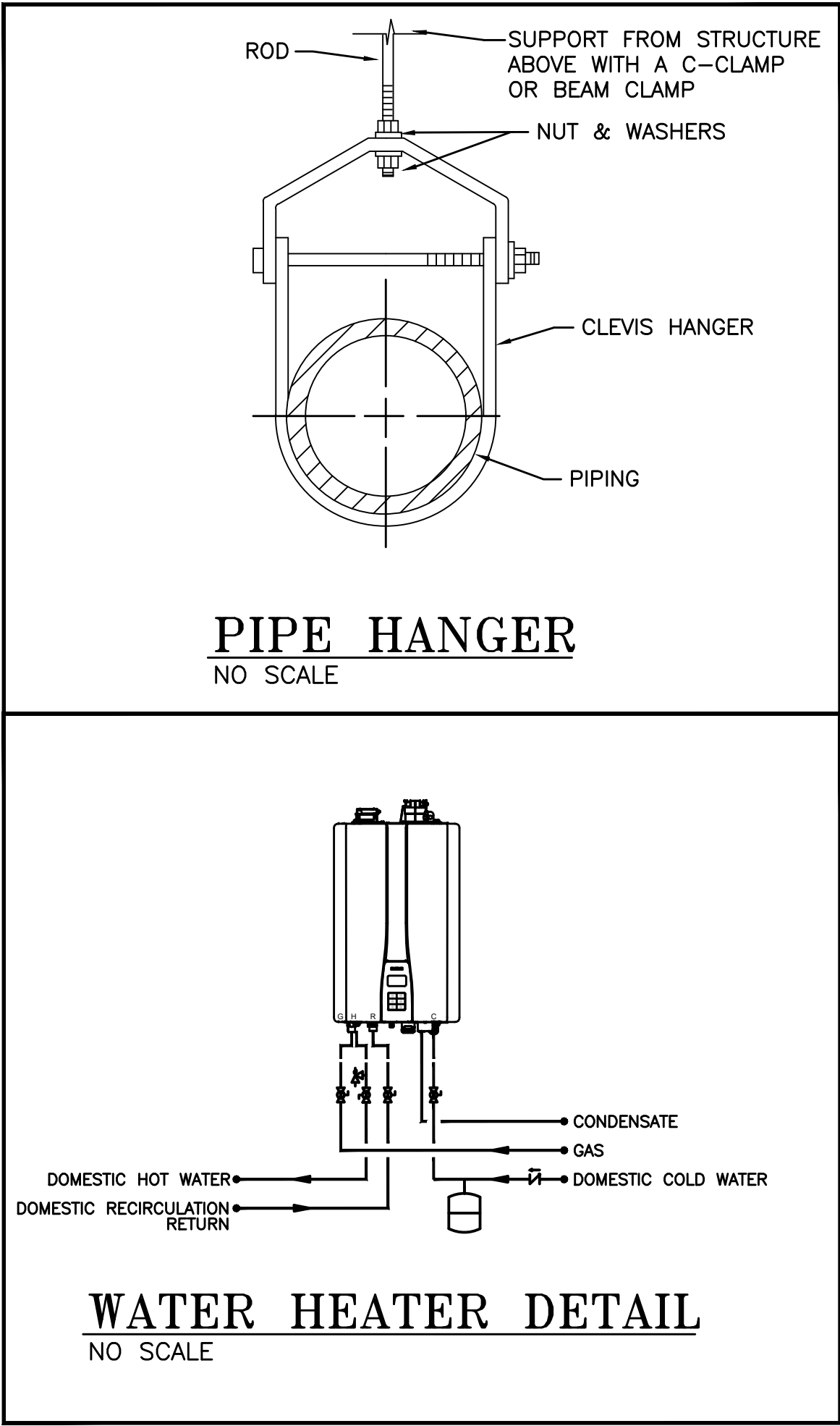
458 KILLWOOD ROAD ELLENFIELD NEW YORK 10829 FAX: 914.898.1179  
(203) 866-4644 TEL: 914.898.4444  
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FULLER  
D'ANGELO  
P.C.  
ARCHITECTS  
PLANNERS

LFG  
252 East Avenue  
Norwalk, CT 06851  
(203) 866-4626 Fax  
(203) 866-8019 Fax  
LANDMARK  
FACILITIES  
GROUP, INC.

PROJECT  
LIFE SKILLS ROOM AND RELATED WORK  
MILBANK SCHOOL  
200 EAST ELM STREET GREENWICH, CT 06830  
DRAWING TITLE  
FIRST FLOOR  
MECHANICAL PLAN

02-17-2023	BID
DATE	ISSUED TO
SHEET SIZE 30"x42"	DRAWING NO. M100
SCALE AS NOTED	FILE NO. 22495.00
DRAWN BY LFG	



PLUMBING SYMBOL LIST	
SYMBOL	NOTE: NOT ALL SYMBOLS ARE USED
---	DESCRIPTION
---	SANITARY PIPE BELOW FLOOR/SLAB (SAN)
---	SANITARY PIPE ABOVE FLOOR/ (SAN)
---	COLD WATER (CW)
---	HOT WATER (HW)
---	HOT WATER RETURN (HWR)
---	VENT PIPE (V)
---	INDIRECT WASTE PIPING
---	DIRECTION OF FLOW
---	PIPE RISE OR UP THRU SLAB
---	PIPE DROP OR DOWN THRU SLAB
---	BOTTOM OF PIPE TAKE-OFF CONNECTION
---	TOP OF PIPE TAKE-OFF CONNECTION
---	P-TRAP
---	CAP PIPE OUTLET
---	CLEANOUT (CO)
---	UNION
---	VALVE IN RISE / VERTICAL
---	POINT OF NEW CONNECTION
---	GAS REGULATOR
---	GAS COCK
---	SHUT-OFF VALVE (BALL VALVE)

PLUMBING ABBREVIATION LIST	
SYMBOL	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
CO	CLEANOUT
CV	CHECK VALVE
CLG	CEILING
CONN	CONNECT
CW	COLD WATER
DN	DOWN (PENETRATES FLOOR SLAB)
DR	DRAIN
DPCO	DECK PLATE CLEANOUT
EX	EXISTING
EL	ELEVATION
FL	FLOOR
HW	HOT WATER
HWR	HOT WATER RECIRCULATION
IW	INDIRECT WASTE
MIN	MINIMUM
NTS	NOT TO SCALE
SAN	SANITARY
GW	GREASE WASTE
TYP	TYPICAL
UP	UP (PENETRATES FLOOR SLAB)
V or VNT	VENT
VIF	VERIFY IN FIELD
W	WASTE
WCO	WALL CLEANOUT

WATER HEATER SCHEDULE														
DESIGNATION	NO. REQUIRED	MANUFACTURER AND MODEL NUMBER	MAX. WATER TEMPERATURE (DEGF)	MIN. WATER TEMPERATURE (DEGF)	HOT WATER CAPACITY	TEMPERATURE RISE (DEGF)	MAXIMUM GAS CONSUMPTION (BTU/Hr)	W.W.P. (PSIG.)	TEST PRESSURE (PSIG.)	WIDTH (INCHES)	HEIGHT/THICKNESS (INCHES)	ELECTRIC		REMARKS
												ELECTRIC LOAD (WATTS)	VOLTAGE	
WH1	1	NAVIENT NPE-240A2	140°	120°	00	100	201,397	150	160	14	24	200	1 120	WALL MOUNTED

NOTES:  
1. REFER TO DRAWINGS, DETAILS, RISERS AND SPECIFICATIONS FOR MORE INFORMATION.



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**GREENWICH PUBLIC SCHOOLS**

Havenkeyer Building  
290 Greenwich Avenue  
Greenwich, Connecticut 06830-6521  
(203) 625-7400

**FULLER  
D'ANGELO  
P.C.**

**ARCHITECTS  
PLANNERS**

48 CHELSEAWOOD ROAD ELmhURST NEW YORK 11538  
(203) 666-8626 FAX: (203) 666-8626  
TEL: (203) 666-8626 FAX: (203) 666-8626  
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**LFG**

252 East Avenue  
Norwalk, CT 06855  
(203) 866-8626 FAX: (203) 866-8626  
LANDMARK FACILITIES GROUP, INC.

PROJECT TITLE  
LIFE SKILLS ROOM AND RELATED WORK

MILBANK SCHOOL  
200 EAST ELM STREET GREENWICH CT 06830

DRAWING TITLE  
PLUMBING SCHEDULE,  
NOTES, LEGEND & DETAILS

DATE  
02-17-2023

SHEET SIZE  
30"x42"

SCALE  
AS NOTED

DRAWN BY  
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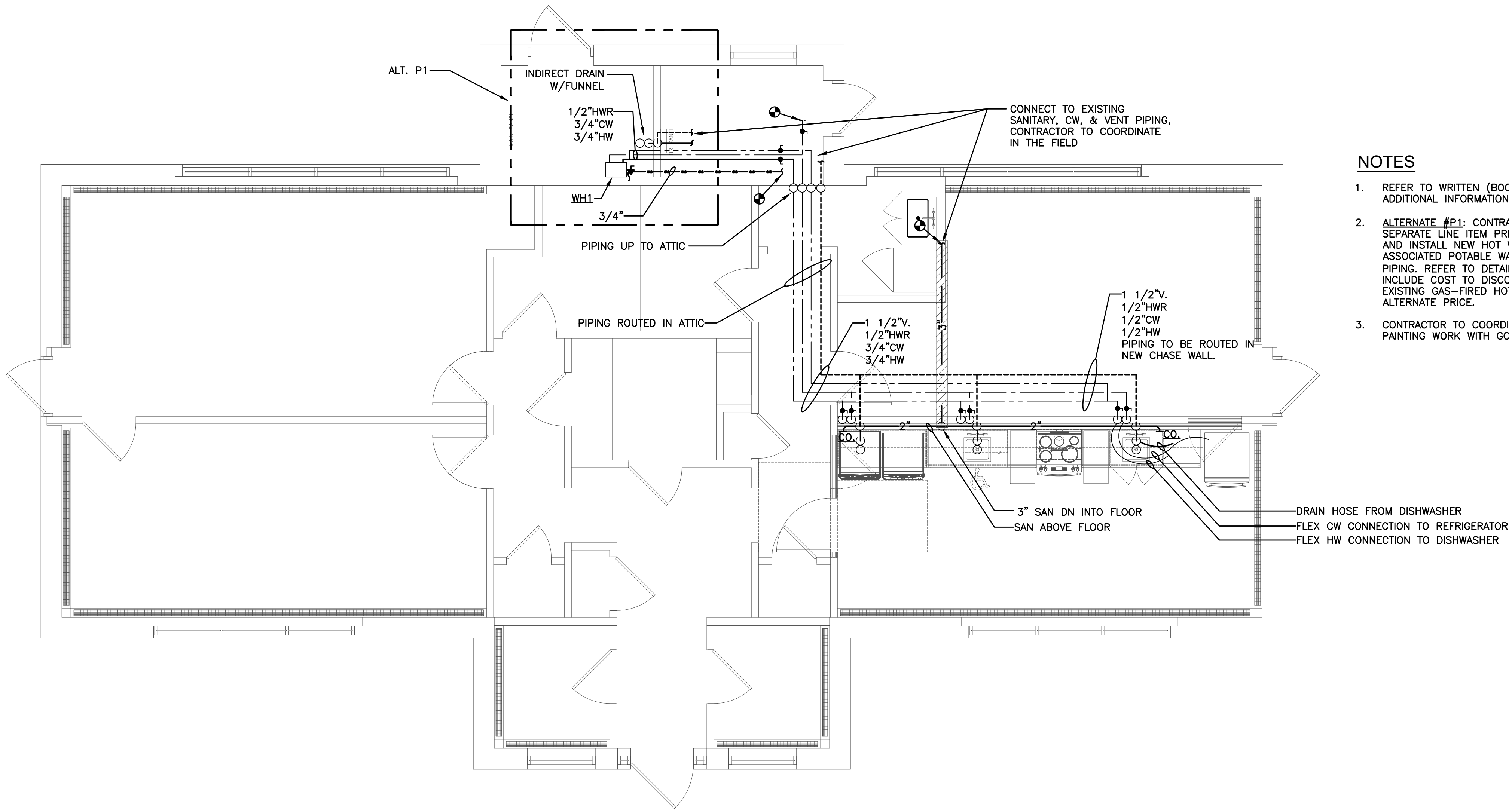
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DRAWING NO.  
**P001**

FILE NO.  
**22495.00**

PLOT DATE: February 16, 2023 -- 11:36am

FILE: N:\Greenwich Public Schools\Milbank School\2023 Life Skills\ACAD\Plumbing\MILBANK LIFE SK\_PLBG.dwg



1 FIRST FLOOR PLUMBING PLAN  
SCALE: 1/4" = 1'-0"

NOTES

1. REFER TO WRITTEN (BOOK) SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. **ALTERNATE #P1:** CONTRACTOR SHALL PROVIDE SEPARATE LINE ITEM PRICE IN BASE BID TO FURNISH AND INSTALL NEW HOT WATER HEATER AND ASSOCIATED POTABLE WATER, NAT. GAS, AND DRAIN PIPING. REFER TO DETAIL FOR ADD'L INFORMATION. INCLUDE COST TO DISCONNECT AND REMOVE EXISTING GAS-FIRED HOT WATER HEATER IN ALTERNATE PRICE.
3. CONTRACTOR TO COORDINATE ALL CUTTING, PATCHING, PAINTING WORK WITH GC.



GREENWICH PUBLIC SCHOOLS  
Haveney Building  
250 Greenwich Avenue  
Greenwich, Connecticut 06830-6521  
(203) 625-7400

408 CHELSEAWOOD ROAD ELLENFIELD NEW YORK 10889 FAX: 914.899.1919  
(203) 666-4644  
TEL: 914.899-4444  
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FULLER  
& D'ANGELO  
P.C.  
ARCHITECTS  
PLANNERS

LFG  
252 East Avenue  
Norwalk, CT 06855  
(203) 866-8026 FAX  
(203) 866-8019 FAX  
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